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European Union Chamber of Commerce in China

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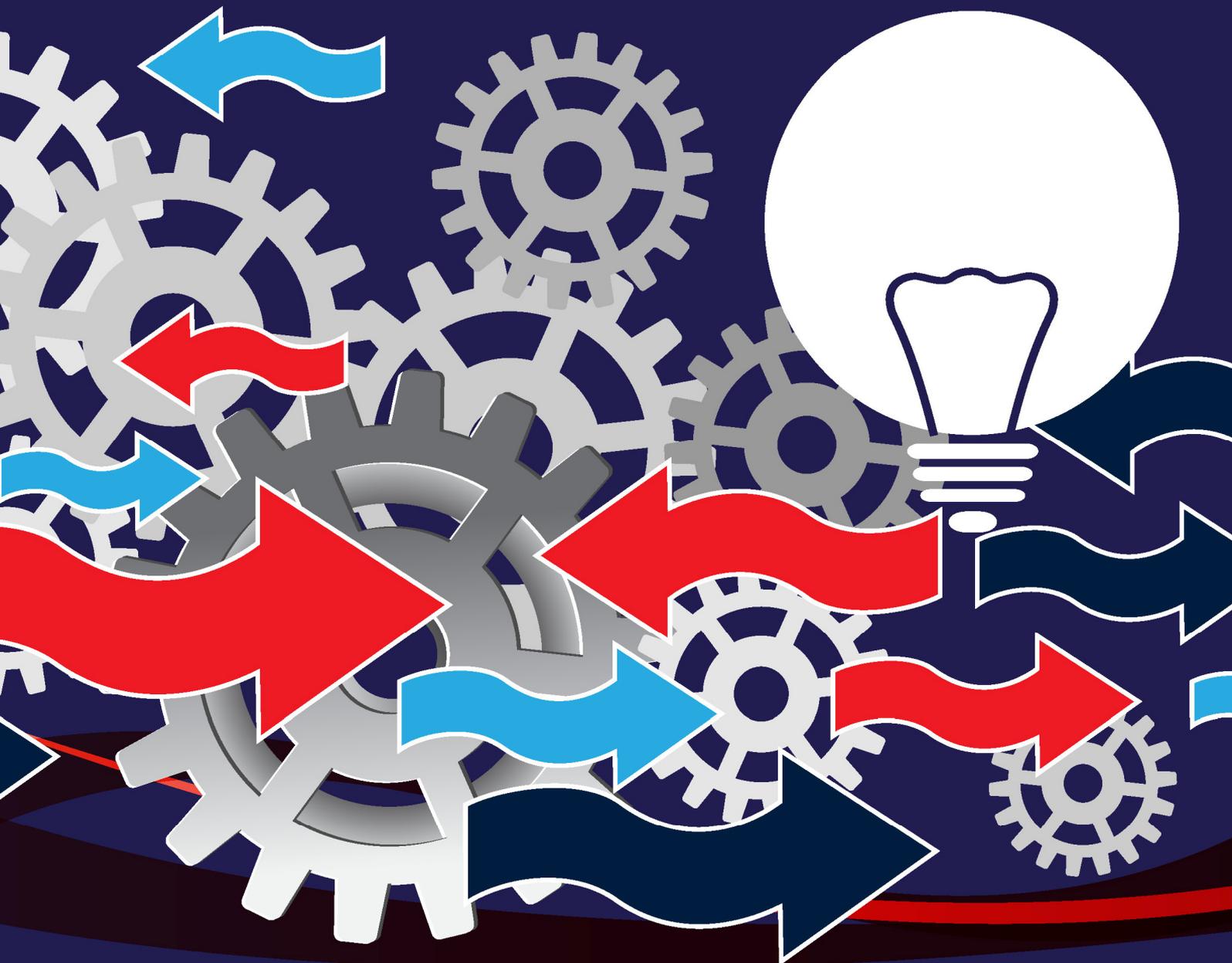
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August 2012

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Acronym List

AAGR	Average Annual Growth Rate
AML	Anti-Monopoly Law
APEA	Asia-Pacific Economic Association
BT	Business Tax
AQSIQ	Administration of Quality Supervision, Inspection and Quarantine
CAGR	Compound Annual Growth Rate
CAS	Chinese Academy of Sciences
CASTED	Chinese Academy of Science and Technology for Development
CCC	China Compulsory Certification
CFTDF	China's Central Foreign Trade Development Fund
CNIS	China National Institute of Standardization
CSC	China Scholarship Council
CSPTAL	China Science Patent & Trademark Agent Ltd.
DWPI	Derwent World Patents Index
EC	European Commission
EIDF	Electronics and IT Development Fund
EIT	Enterprise Income Tax
EPO	European Patent Office
ETSI	European Telecommunication Standards Institute
Eurostat	Statistical office of the European Union
FDI	Foreign Direct Investment
FIE	Foreign Invested Enterprise
FRAND	Fair, Reasonable, and Non-Discriminatory terms
GAC	General Administration of Customs
GERD	Gross Expenditures on Research and Development
GOVERD	R&D Expenditures in the Government sector
HERD	R&D Expenditures in the Higher Education sector
HNTE	High and New Technology Enterprise
IIP	Indigenous Innovation Policy
IMF	International Monetary Fund
IND IP	'Indigenous' Intellectual Property Rights
IP	Intellectual Property
IPDRC	Intellectual Property Development and Research Centre
IPR	Intellectual Property Rights
JPO	Japan Patent Office
JV	Joint Venture
KPIs	Key Performance Indicators
MIIT	Ministry of Industry and Information Technology
MLPS	Multi-Level Protection Scheme
MoF	Ministry of Finance
MOFCOM	Ministry of Commerce
MOFTEC	Ministry of Foreign Trade and Economic Cooperation
MoST	Ministry of Science and Technology
MPS	Ministry of Public Security
NCAC	National Copyright Administration of China
NDRC	National Development and Reform Commission
NIIP	National Indigenous Innovation Products

NPDS	National Patent Development Strategy
NPEs	Non-Practicing Entities
NSFC	National Natural Science Foundation of China
OECD	Organisation for Economic Co-operation and Development
PBoC	People's Bank of China
PCT	Patent Cooperation Treaty
PI	Preliminary Injunction
PLA GAD	People's Liberation Army General Armament Department
PRB	Patent Re-Examination Board
PSB	Public Security Bureau
PVP	Plant Variety Protection
R&D	Research & Development
RIS	Regional Innovation Scoreboard
ROI	Return on Investment
RoW	Rest of the World
S&T	Science and Technology
S&T MLP	Guidelines on National Medium and Long-term Program for Science and Technology Development
SAC	Standards Administration of China
SAIC	State Administration for Industry and Commerce
SASAC	State-owned Assets Supervision and Administration Commission
SAT	State Administration of Taxation
SC	State Council
SCM	Subsidies and Countervailing Duties Measures
SDO	Standards Development Organisation
SFDA	State Food and Drug Administration
SIPO	China's State Intellectual Property Office
SME	Small and Medium-sized Enterprise
SOE	State-Owned Enterprise
SPC	Supreme People's Court
SSO	Standards Setting Organisation
TASE	Technically Advanced Service Enterprises
TCM	Trusted Cryptography Model
TIER	Regulations on Technology, Import and Export administration
TRIPS	Trade-Related Aspects of Intellectual Property Rights
UPOV	International Union for the Protection of New Varieties of Plants
USCBC	US-China Business Council
USPTO	US Patent and Trademark Office
VAT	Value-Added Tax
WAPI	WLAN Authentication and Privacy Infrastructure
WFOE	Wholly Foreign-Owned Enterprise
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

Executive Summary

China's ability to innovate is becoming an increasingly important global issue, whereas without strong innovation as the next stage in the country's development process, its economic growth, while impressive to date, will stagnate and thus create dramatic consequences not just in China but also abroad. To be sure, innovation, which can be defined as the collective act of inventing (creating something considered "new") and exploiting that invention, is touted in an array of economic literature as an important tool for countries to build competitiveness and thus in the long-term drive their economies. Not only will China's future ability to innovate decide its future, but it deeply impacts foreign countries, many of who heavily rely on both demand and supply from China. In short, the future direction of the world economy – inclusive of many businesses, consumers, and governments – to a notable extent hinges on China's ability to innovate.

In assessing China's innovation capabilities, this study looks into a variety of innovation metrics yet focuses on one often overlooked area: patent quality. Patents, which are legal rights to exclude others from exploiting (i.e. making, using, or selling) inventions, are linked to innovation as, while by no means an ideal single indicator, they can be used as an intermediate measure of innovation, i.e. an invention output upon which innovation is built. Unfortunately, absolute numbers of patents are often solely used or otherwise overemphasised as a measure of innovation. In fact, patent quality provides far more insight into innovation capacity as it measures actual application of inventions in a way that impacts society.

While patents are exploding in China and certain innovation is also on the rise, patent quality has not proportionately kept up and in fact the overall strength of China's actual innovation appears overhyped. Statistical analysis in this study not only reveals concerning trends in the quality of China's patents at present, but suggests that while patent filings in China will likely continue to notably grow in the future, patent quality may continue to lag these numbers. In fact, projections in this study indicate there might be over 2.6 million less-than-"highest-quality" patents filed in China in 2015 alone, which is substantially more than estimated "highest-quality" patents filings in that year. With this in mind, and objectively considering its performance on additional innovation metrics, it is clear that China's innovation ecosystem deserves a new type of scrutiny.

The core of this study is devoted to investigating, through in-depth on-the-ground research and analysis, significant reasons for China's patent quality and related innovation shortcomings. In an effort to hone this investigation, the study focuses on key unaddressed institutional and regulatory issues closely related to patent quality that can be practically remedied in the near future.

This study uncovers how a network of patent-related policies, other measures, and practices in China collectively hamper both patent quality and innovation at large. These dulling devices are categorised in terms of certain government-set patent targets and indicators (Chapter 2); policies and other measures meant to promote patents (Chapter 3); and rules and procedures for reviewing patent applications and those for enforcing patents (Chapter 4). Although given their intertwined nature it is not always possible to clearly separate their impacts on patent quality as distinct from those on innovation at large, these dulling devices collectively create a vicious cycle: they hamper patent quality which then hampers innovation and vice versa, i.e. hamper components of innovation which then hampers patent quality, which then again further hampers innovation.

Over 50 practical recommendations are proposed to remedy the concerns flagged in the analysis. Abridged versions of some of these are included in this Executive Summary.

This study is not just an important read for intellectual property rights (IPR) professionals, academics, business leaders, and government officials, but also anyone interested in understanding both the nuances within and important impacts of China's regulatory and institutional environment for innovation. In fact, it provides insights into arguably one of the most important legal and economic questions determining China's future, and, as a consequence, the future of the world economy.

Section Summaries

Introduction

This section discusses key terms and other information that is essential to know before starting a new assessment on China's patent quality situation and larger innovation ecosystem.

This study sets out a number of definitions for the main types of innovation. It refers to two main recognised categories of innovation: "breakthrough innovation," creation of brand new/cutting-edge innovations; and "incremental innovation," exploitation of existing innovations in a way that improves upon them, but less dramatically than via breakthrough innovation. While both forms of innovation have value, breakthrough innovation typically affords a higher level of competitiveness than incremental innovation. In terms of application, innovation is manifested through exploitation of inventions in goods, services, processes, organisation, or marketing.

China grants three types of what it considers "patents": invention patents ("invention patents"), utility model patents ("utility models"), and design patents (sometimes also called registered designs).¹ Not all countries grant these same three types of patents, although most countries have the equivalent of China's invention patent, and sources suggest that over 40 countries, including a number in Europe, have a utility model patent system.

The definitions for different thresholds of patent quality used in this study are as follows:

- "Quality patents" must (1) meet or exceed the statutory requirements for patentability in China, and (2) have reasonable prospects of (i) ultimately being commercialised or (ii) otherwise being transformed to contribute to social, economic and/or environmental progress in China;
- "Highest-quality patents" must (1)-(2) meet or exceed the two criteria for quality patents (see aforementioned definition); and (3) best advance Chinese government objectives of sustainably increasing breakthrough research and innovation led by domestic entities and foreign-invested enterprises (FIEs) in China; and
- "Low-quality patents" are those that do not meet the aforementioned standard for quality (or highest-quality) patents.

The study broadly categorises China's three types of patents within these definitions. It posits that on one hand, given their higher invalidation rates and higher risk of being filed solely for and used in "malicious prosecution actions," utility models have a higher risk of being of lower quality than invention patents. On the other hand, it is important to recognise that a variety of evidence debunks the idea that utility model patents are always of low value, whereas a range of empirical studies show that the utility model system in certain countries successfully enables movement from relatively low levels of innovation and competitiveness, and poor diffusion of technology, to higher levels. Still, given the higher patentability threshold for invention patents as confirmed by a Substantive Examination, utility models and design patents are typically of less-than-highest-quality

¹ Invention patents can be granted to both products and processes, and must meet a standard for novelty (not part of the "*prior art*," i.e. not openly known to the public abroad or in China before their filing date), "inventiveness," and practical use as determined by a review called a Substantive Examination. Utility models can be granted on the shape and/or structure of a product, and do not undergo a Substantive Examination but are required to be novel, meet a far lower level of "inventiveness" than invention patents, and must meet criteria for practical use/functionality. Invention patents and utility models enjoy basically the same level of legal protection during their lifetimes. Design patents are granted on the appearance of a product that makes it particularly recognisable, do not undergo a Substantive Examination nor have to meet any technical or functional thresholds but must be distinct from prior designs, and should not conflict with prior rights like copyrights or trademarks.

whereas invention patents have a much higher chance of being highest-quality. Given these findings, this study suggests not all utility models and design patents in China are inherently of low-quality; however, subject to contextualisation, the study suggests that utility models and design patents in China are generally not of highest-quality, whereas invention patents have a much higher chance of being highest-quality.

This study reviews a substantial volume of major recent Chinese policies and other measures dealing with patent development. Review of these documents suggests that Chinese regulators have recently enacted and are currently further enacting a range of commendable initiatives to address China's patent quality problem: for example, within the most recent major provincial/municipal and national-level policies reviewed in this study alone, there are over 80 references to initiatives to improve future IPR and/or patent-specific "quality." And this is to say nothing of the massive number of other important provisions reviewed that intend to build patent quality but simply do not mention the specific keyword "quality." A listing of the main types of patent quality-related issues openly discussed in China and for which certain initiatives are being enacted can be found in the Introduction in the full version of this study (also a selection of related policy statements are translated into English in the Annexes of this study, and many are referenced throughout the study).

In late 2011, what appears to be the first detailed assessment of China's patent quality problem was completed by Gao, Li, and Cheng of the Beijing IPR Institute; still, while that study is an important contribution to the debate over patent quality in China, significantly more investigation is needed to fully understand and address China's patent quality problem – and filling this need, along with looking into certain aspects of the larger innovation ecosystem in China, is the objective of this study. Still, this study is not intended to detail all issues that affect patent quality and innovation at large in China in any capacity; rather, it focuses on key unaddressed institutional and regulatory issues most closely related to patent quality that can be practically remedied in the near future.²

Chapter 1: Statistical analysis of China's patent quality situation and larger innovation ecosystem

Statistical analysis suggests that while patent filings are exploding in China and certain innovation is also admirably on the rise, this has not necessarily translated into a 'proportionate' rise in patent quality and in some sense the strength of China's actual innovation is overhyped.

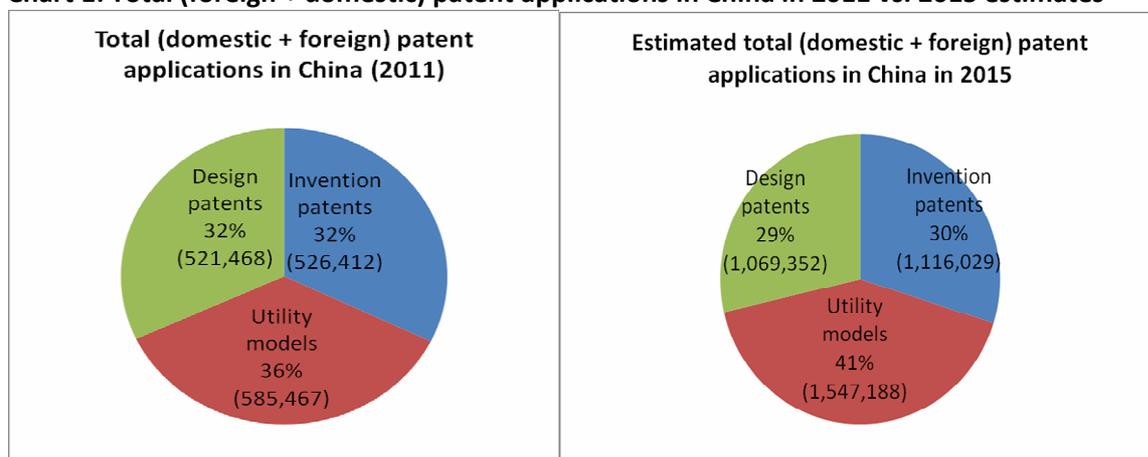
² **Note on scope:** The research and analysis in Chapters 2-4 focus of the study focus on certain key institutional and regulatory issues most closely related to patent quality that (1) appear to be largely unaddressed at present (whereas "unaddressed" means (a) not appearing from readily available evidence to be undergoing significant enough reforms or (b) already have undergone reforms that have arguably had enough time to take effect but still remain largely ineffective; of note, in a few instances, short of making allegations that certain initiatives clearly "do not" effectively address or are actually detrimental to patent quality, the study identifies areas where, given limited readily available information, further discussion is warranted with the authorities to clarify the details of such otherwise concerning initiatives); and (2) of these, issues that with the proper government buy-in can be relatively practically remedied in the near future. "Key" herein refers to issues deemed most significant.

Patent quality situation

Analysis of a variety of patent statistics suggests that China’s progress in patent quality lags behind its rates of patent filings. There are higher ratios of domestic to foreign filings of invention patents in EU countries sampled than in China. There are significantly lower average life-spans of Chinese patents and lower percentages of patents in-force owned by domestic filers vs. foreign filers in China compared with the rates in EU and other countries sampled; higher rates of utility model invalidations than invention patent and design patent invalidations; concerning rates of patents filed solely for malicious prosecution actions, which may be made up more so of utility models than other types of patents; poor scores in terms of patent citations; and empirical econometric analyses generally show foreign enterprises at large do not typically file patents on breakthrough inventions in China. China also has lacklustre scores on several other patent quality indicators. In effect, the analysis confirms that China indeed has a patent quality problem as certain scholars and industry experts, as well as Chinese government officials in meetings with the European Chamber and otherwise, have suspected.

In addition, it is troublesome when looking ahead to realise the possibility that China’s patent ecosystem may be less composed of highest-quality patents than perhaps envisaged (see Chart 1). For example, this study’s projections indicate that, all else constant, there might be over 2.6 million less-than-highest-quality patents (utility models and design patents) filed in China in 2015 alone, which would be substantially more than the estimated filings of highest-quality patents in that year. Of note, it is projected there might be 39% more (over 430,000) total utility model applications than total invention patent applications filed in China in 2015, which is 28 percentage points more than the comparison rate between the two in 2011. The year 2015 is significant because major Chinese policies set it as the year by which their patent targets are to be realised.

Chart 1: Total (foreign + domestic) patent applications in China in 2011 vs. 2015 estimates*



Source: SIPO statistics; calculations; 2015 estimates using methodological Approach A discussed in the “Chapter 1” section in the Annex

Innovation ecosystem at large

In terms of its innovation capacity at large, metrics suggests that China indeed has a growingly impressive innovation potential, although in some sense its actual innovation is overhyped. For example, China does not attract EU innovation spending on a scale as perhaps otherwise suspected; and, despite some exceptions, empirical evidence suggests foreign firms at large avoid developing or transferring breakthrough technology, and filing patents on such technology, in China. There are reports of concerning distribution of government-sponsored innovation investment, which can drag

down innovation; and evidence that Chinese State-Owned Enterprises (SOEs), in which many innovation hopes are invested, typically lag on a variety of innovation metrics. Further, even the most positive rankings show there are at least 20 highly competitive countries that are more innovative than China at present, which, from one point of view at least, is in fact a sizeable number.

Chapter 2: Government-set patent targets and indicators

China has emphasised a range of quantitative patent targets, which while ambitious may not encourage quality let alone highest-quality patents and innovation as efficiently and effectively as envisaged; in fact, they may actually discourage highest-quality patents and at worst may sometimes actually encourage development and filing of low-quality patents. Similarly, a range of patent indicators in performance evaluation systems deserve scrutiny to determine their impact on patent quality and innovation at large.

Quantitative patent targets

The range of quantitative patent targets set out in China at the national, provincial/municipal, and local levels, while in some ways admirable, are also concerning in that some do not include helpful targets for ensuring patent quality. Within major recent policy documents reviewed for this study, there are over 10 national-level quantitative future patent targets, and over 150 provincial/municipal quantitative patent targets, mostly for 2015. Examples of these are included in Table 1 below (and all reviewed indicators are translated into English in the Annex of the full version of this study).

Table 1: Example quantitative patent indicators in major recent Chinese policy documents

Name of policy	Quantitative patent target
<i>China's National Patent Development Strategy (2011-2020)</i>	2 million annual patent filings by 2015
<i>Hebei's 12th Five-Year IP Plan</i> (issued in 2011)	Targets by the year of 2015: <ul style="list-style-type: none"> • Annual patent applications = 25,000 • Patent applications \geq 12% annual growth rate • Annual invention patent applications = 8,000 • Invention patent applications \geq 15% annual growth rate
<i>State Council (SC)'s Notice on IPR in Strategic Emerging Industries</i> (issued in 2011)	By 2015, triple the number of international patent applications in strategic emerging industries compared to the number in 2010

Source: Author's selection of patent targets from some policies reviewed

While most of the policies reviewed appear to set forth relatively solid patent targets, there are at least some minor weaknesses in the plans. Some appear to only set targets for patent applications, whereas by no means are all patents filed actually granted or transformed into useful patents; most proposals do not appear to set indicators for "patents in-force," a key indicator of how and if patents are being utilised; most proposals do not set any type of quantitative future indicators for reducing infringement to supplement their other quantitative targets; and the policies do not specifically mention potential 'double-counting' of utility models later abandoned for invention patents in meeting their quantitative targets.

Moreover, the most fundamental problem with what appears to be an overly heavy focus on quantitative patent targets in China is it overshadows the type of benchmarking that better reflects the nuances underlying creativity and actual utilisation of inventions, which are fundamental

building blocks of quality patents and highest-quality patents in particular. One cannot ‘force’ creativity, but instead must nurture it, whereas creativity leading to breakthroughs of the type that typically produce the highest-quality patents at best comes in spurts and is most often only realised in the mid- to long-term through a range of solid inputs. Further, absolute numbers of patents are an imperfect single indicator of the actual economic relevance of inventions (i.e. their ability to be transformed into something useful, and thus constitute innovation), and what appears to be China’s overly heavy focus on quantitative patent targets instead of a more dynamic gauging of a range of innovation-relevant targets (e.g. those involving educational capacity, R&D returns, certain product-to-market introductions, and patent quality metrics) may not optimally, or at worst distortedly, foster innovation in China. Also, given the still developing nature of China’s regulatory and institutional framework, for example in comparison to developed European countries, it is easier for lone patent targets as opposed to a composite of innovation targets to be reached through a skirting of appropriate monitoring and evaluation, IPR enforcement, and other quality control mechanisms. As such, overemphasis on quantitative patent targets in China undermines the ostensible underlying policy objectives of the targets to sustainably build quality patents and innovation at large.

Patent-based performance evaluations

Assurances from different government officials would be helpful to ensure the variety of patent-based performance evaluation mechanisms for Chinese SOEs; other enterprises; experts/academics and managers, and research institutes and universities; as well a variety of staff performance and programme evaluation criteria for Party officials and government ministries, sufficiently discourage low-quality patents and actually encourage quality patents and innovation at large. In terms of specific ministries, it is worth further investigation with regulators if the patent-indicator-based SOE evaluation criteria of the State-owned Assets Supervision and Administration Commission (SASAC) and other ministries sufficiently discourages SOEs from filing patents of lower than desired quality to meet indicators, keeping in mind that roughly 65% of medium-to-large sized Chinese SOE’s patent applications in recent years are for utility models and design patents; if the Ministry of Science and Technology (MoST) and other government/quasi-government science & technology (S&T)-promotion entities’ patent-based performance evaluations for projects sufficiently builds highest-quality patents; how exactly SIPO’s performance criteria for examiners works; and how effective efforts have been to improve the performance of patent intermediary services (patent application writers) in China.

Other targets

Cross-cutting the patent target and performance review issues mentioned is some concern that GDP targets imposed by provincial/municipal level governments in China may in some ways discourage risk-taking needed to boost breakthrough innovation and create according patents in a way that other types of indicators might do better.

Select and Abridged Recommendations:

- Consider alternative strategies and composite metrics for measuring the strength of Chinese innovativeness (e.g. based on the equivalent of the European Commission (EC)'s Regional Innovation Scoreboard (RIS)), and base policy more so on these approaches than overly on quantitative patent targets.
- Review SASAC's performance evaluation mechanism for SOEs to ensure that any patent-based evaluation process best stimulates quality patents, and therein undertake a number of specific reforms suggested in Chapter 1 of this study.
- The SC, in partnership with relevant ministries, could set-up an incentive system and monitoring mechanism whereby departments that implement the best systems for specifically encouraging patent *quality* are given certain recognitions/awards.

Chapter 3: Other policies meant to promote patents

China has a wide-range of patent-specific, and otherwise patent-related, policies and other measures in place, many of which are at least partially meant to encourage patents; however, some of these can actually discourage quality patents, and highest-quality patents in particular, and innovation.

Patent-specific measures

Patent filing subsidies

Some governments across China are commendably already taking steps to reform their approaches to subsidising official fees for patent application processing and related attorney fees. However, a number of specific initiatives that do not appear to be currently discussed, at least publically, could be undertaken to more fully improve this system.

Indigenous Innovation Policies linked to financial incentives

There are a variety of Indigenous Innovation Policies (IIPs) based upon overly restrictive IPR requirements linked to financial incentives that appear currently in-force. While the IIP system was delinked from government procurement via a number of well-received policy proclamations in 2011, the essence of the IIP system, in terms of setting forth controversial IPR requirements linked with financial incentives, appears very much still in force.³ These controversial IP requirements are embodied in the term "*indigenous intellectual property rights*" (zìzhǔ zhīshì chǎnquán/自主知识产权) which appears to typically be defined as IPR owned by a Chinese entity (which is specifically defined as an entity that does not have foreign majority ownership). (While not the norm, the term is defined somewhat differently in the HNTE tax scheme [see below section on the scheme for

³ Central-level public statements requiring this delinking were issued on July 1st 2011, a written notice on July 4th 2011, and another written notice on November 17th 2011. Also, the April 2010 *Draft Notice Regarding the Launch of the National Indigenous Innovation Product Accreditation Work for 2010*, which was interpreted as altering controversial IP provisions to allow for licensing of IP for use in China that is owned abroad as an alternative method for qualifying under IIP preferences rather than via otherwise required IP ownership or licensing of IP fully owned by a Chinese entity, does not appear to be in-force at present and it is unclear if it was ever in-force. And no other measures appear to have subsequently taken that measure's place in making such changes. As such, it appears China's IIP framework is not legally bound to only instituting the type of IP requirements that were present in the *April 2010 Draft Notice*.

details]; and in some cases includes an option for restricted licensing of IP fully owned by a Chinese entity.) Hereafter these aforementioned concepts of indigenous intellectual property rights are collectively referred to as “IND IP” requirements.⁴

This study finds several IND IP requirements, many of which are directly linked to financial incentives, in measures that appear to still be in-force. Examples of these (which are discussed within subsequent sections hereto) include:

- Specific indigenous innovation product accreditation/management measures from sub-central level governments;
- Measures that stipulate IND IP requirements as an exclusive precondition for qualifying for subsidies from a foreign trade fund worth several billion Euros;
- 2011 measures from provinces and municipalities on subsidising enterprises that meet IND IP requirements using monies from various S&T and other invention-specific funds;
- Policies setting out IP ownership targets for 2015 that are linked with funding through measures still being drafted; and
- Measures underpinning the HNTE tax scheme.
- Measures setting IND IP requirements linked to significant financial grants for developing standards.

While building IND IP can indeed boost innovation and patent quality, the devil is in the details in terms of how this is approached. Criticisms presented of current IND-IP-based innovation policy include:

- First, ‘IND IP thought’ in current IIPs in terms of specific IND IP requirements linked to financial incentives does not seem to be an optimal approach to innovation grounded in rigorously proven (e.g. empirical) economic evidence – and thus what appears to be overemphasis on this approach can indoctrinate the policymaking system in a way that prevents creation and implementation of other domestic Chinese innovation policies that could be more helpful for building-up innovation and longer-term quality patent filings. This phenomenon is likely compounded by the comparative power of certain personalities in ministries making innovation policy which complicate a truly collegial approach to policymaking.
- Second, it seems unlikely that IND-IP-based policies will effectively stimulate competitive foreign firms at large to increasingly transfer ownership of IP or provide exclusive licenses to Chinese entities. In fact, the contrary may happen as these policies do nothing to alleviate the fear about the quality of the IPR environment in China and such policies in fact worsen foreign enterprises’ perception of the friendlessness of the innovation environment at large in China.
- Third, IND-IP-based policies, particularly when combined with other factors, may even push some companies to develop certain innovation initiatives in alternative countries where they can enjoy policies that allow them to contribute to local innovation and quality patents without such pressure. On a related note, given the globalised nature of production chains at present, China’s national economic and technological security justifications for IND IP policies may not be particularly warranted.
- Fourth, China’s IND IP policies may conflict with WTO rules, particularly Article 3 of the WTO’s *Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement*, and thus if effectively challenged will need to be replaced by a strategy that less discriminatorily attempts to promote patent-building and innovation.

⁴ Note 1: Although some measures using the term conspicuously do not define the term. Note 2: The definitions used in the *April 2010 Draft Notice* are not considered to constitute IND IP requirements.

Sub-central level indigenous innovation product accreditation/management measures

Although many sub-central level indigenous innovation product accreditation/management measures that contain concerning IND IP requirements have clearly been invalidated at some point in 2011, some do not appear to be officially invalidated. It is thus worth investigating if they are currently or in the future will be linked to financial incentives, albeit outside government procurement preferences. At a very minimum, if the measures have been invalidated through non-publicly disclosed notices, it is disconcerting they are still published online with no such notifications.

Foreign trade subsidies

A variety of measures that include IND IP and export-based preconditions for receiving subsidies are a drag on patent quality for the same reasons mentioned above, and also given they appear to conflict with Article 3 of the WTO's *Subsidies and Countervailing Duties (SCM) Agreement* among other provisions in China's WTO commitments. Some of these subsidies are from China's Central Foreign Trade Development Fund (CFTDF), a fund worth over 37.7 billion RMB according to even old estimates which has somehow flown under the radar of even industry insiders.

Various sub-central level incentives

While setting out some quite commendable initiatives stimulating invention, some provincial/municipal measures are questionably effective in promoting patent quality and innovation. These include measures subsidising enterprises that meet IND IP requirements using monies from various S&T and other invention-specific funds. Another interesting example is provisions in national-level law, implemented in some provinces, that prisoners, even those with life sentences, can commute their sentences if they produce "inventions or major technological renovations." Most other examples surround incentives for employers to motivate their employees to invent, whereas it is unclear how these approaches change behaviour not just for the sake of producing patents but to also better contribute to the overall competitiveness of their employing institution.

Central-level S&T funding programs

A range of large funds are available to domestic Chinese institutions, and much less so to foreign institutions, for innovation – for example via MoST's Key Technologies Program, 863 Program, 973 Program, Torch Program, and National Key Laboratories program – that are built on a number of overly broad restrictions that in some cases lessen the effectiveness of such projects' ability to build quality patents. Article 20 of the *Law on Scientific and Technological Progress* stipulates the Chinese government must own technology resulting from research partnerships that tap into government S&T funds and is relevant to "national interest," a concept distinguished from national security and public interests. Further, money or other support from SOEs, universities, or government-funded institutes used to fund such projects may also be considered to fall under these restrictions in certain cases. There are also requirements that exclusive licensing of IP resulting from such projects to foreign entities requires burdensome government approvals. In contrast, the EC's rules for funding research and technological development are far more flexible, and as a consequence this difference of treatment appears to be in conflict with several provisions in the *Agreement for Scientific and Technological Cooperation between the European Community and the Government of the People's Republic of China*. While some recent policy statements, in particular the *2012 National IP Strategy*, appear to acknowledge China's current S&T funding system needs more reform, it is uncertain how these policies will be implemented in a way that better stimulates patent quality and related innovation.

HNTE scheme

While certain tax components of the High and New Technology Enterprise (HNTE) status scheme are not new to industry insiders, less discussed components of the scheme directly related to patents can undermine the underlying objective of the program to build highest-quality patents in China. Many components of the HNTE scheme raise concerns mentioned in the above section on IND-IP-based policies, whereas the HNTE scheme stipulates overly restrictive qualifying enterprises must own core IP registered in China or have “worldwide rights to the exclusive use” of IP for five or more years, although some suggest that in practice this latter condition is legally impossible to satisfy. Further, while positive restrictions are put on the types and usage of utility models and design patents that can be used in applying for HNTE status, Chinese government consultations suggest that many enterprises take advantage of the criterion in the HNTE Application Form that allows six utility model patents to constitute one invention patent for the purposes of applying for HNTE status. Overall, there is room for concern that the HNTE scheme as is does not best stimulate highest-quality patents and related innovation.

Standards

Discriminatory standard-making procedures, withholding information on such standards, and discriminatory *de jure* standards and *de facto* application of standards have long been used to promote Chinese innovation, and these initiatives stifle competition, potentially denying the Chinese market certain patents and know-how. Specifically:

- FIEs often do not have access to the Technical Committees in which standards are decided, and therefore cannot join patent pools;
- FIEs are unable to obtain information on the scope and requirements of patents to implement the standards that are frequently used in mandatory certification schemes;
- Standardisation is frequently and increasingly being used to promote Chinese technologies or other inventions by developing national standards exclusively reflecting the capabilities of SOEs and certain private Chinese companies;
- European IP holders have continued to experience great difficulties in engaging the Chinese telecommunications industry in licensing discussions over “essential” patents, i.e. those containing one or more claims that are critical to the implementation of a technical specification or standard;
- Direct competitors of applicants have unnecessary access to IP submitted in application documents for chemical projects in China above \$300 million USD and often also for smaller projects;
- Direct competitors of applicants sit on the State Food and Drug Administration (SFDA)’s approval panel for pharmaceuticals and thus access the applicant’s IP, and can delay approval of pharmaceuticals while they themselves seek approval on a similar or the same one(s);
- Enterprises remain concerned over proprietary IPR leakage during China Compulsory Certification (CCC) Mark certification given recent revisions to related rules allegedly still do not adequately reform the system;
- The Multi-Level Protection Scheme (MLPS) includes domestic IP requirements that do not allow foreign companies to build a variety of Chinese infrastructure, whether as part of government procurement or commercial initiatives; and
- Certain measures encourage standardisation via potentially concerning IND IP requirements linked to significant subsidies, for example those providing 1 million RMB per standard developed.

Overall, the aforementioned Chinese standardisation policies may actively encourage standardisation initiatives that will ultimately fail domestically and/or fail during international expansion attempts, thus wasting resources and detracting from healthy innovation and the associated building of quality patents. Also, some initiatives raise the same aforementioned concerns surrounding IND IP provisions.

Raw deals in closed sectors

In closed sectors where the only way of market access is through Joint Ventures (JVs) with Chinese companies, usually SOEs, sources suggest the Chinese partner may leverage low-quality patent portfolios, “force” disclosure of know-how, and otherwise create what are considered in this study as “raw deals” – all of which in turn create a drag on patent quality and innovation at large. Specifically, sources suggest that in this situation:

- Chinese firms may leverage patent portfolios of dubious quality to get a better financial deal via demanding royalties while using their superior negotiating position to block due diligence on the contents of these patents;
- The prospective Chinese JV partner of a foreign enterprise may unreasonably require transfer of key patented technology as a precondition to entering the JV;
- Prospective Chinese partners may use other forceful tactics to acquire know-how, for example requiring foreign partners open an R&D centre in China as a precondition for entering a JV; and
- Raw deals of different types are found in the government procurement bidding process, for example in the rail industry.
- Compounding the abovementioned concerns, sources identify instances where Chinese SOEs, after they acquire foreign technology through such raw deals, utilise preferential government support to strategically displace foreign firms from the domestic Chinese and even foreign markets.

From one perspective, the raw deal approach might be justified by arguing the Chinese market is ‘just too good to give up’ for some companies’ business operations and thus they must agree to deals they would not have in other less promising markets. However, at large, empirical evidence to date shows this is not the case for breakthrough innovation-intensive operations that involve patents. Also, forcing technology transfer has made Chinese firms more reliant on foreign technology, and worse, sometimes has even made such Chinese firms lose the independent innovation capacity they may have once had. Additionally, it is possible that the raw deal phenomenon creates a perverse incentive for Chinese companies to register less-than-highest-quality patents. Further, the market access for technology arrangements at the heart of many raw deals are in conflict with WTO commitments, which might be an additional argument for foreign nations, especially those put under pressure by the financial crisis, to support their own stricter techno-economic security policies in response to such deals. As such, it is neither effective nor efficient policy to rely on raw deals to push companies to contribute to the development of highest-quality patents in China, and in fact these practices may very well instead deter enterprises from contributing valuable knowledge to building highest-quality patents and linked innovation in China.

Technology import and export rules

Several ambiguities in the rules on technology import and export create a drag on patent quality in China. Article 27 of the *Administrative Measures for the Registration of Technology Import and Export Contracts (TIER)*, which requires that subsequent improvements on technology development in contractual relationships are owned by the party making the improvements, creates notable ambiguity for entities working with others to innovate, resulting in a drag on patent quality. The *TIER* are also unclear about what technologies are covered within their category of “restricted” and, even

more unclear regarding “prohibited” import/export technology. The definition of “technology import and export” in Article 2 of the measures is overly broad. Lastly, Article 24 of the *TIER* sets overly burdensome requirements in mandating foreign technology licensors to bear liability for any accusation of infringement that may be brought against a technology importer in relation to the use of licensed technology. All of these requirements create uncertainty that hampers building of quality patents and innovation at large.

Inventor remuneration rules

Although some provinces have undertaken initiatives to shape the inventor remuneration system, at large there are unclear requirements in China’s remuneration rules that sometimes make companies reluctant to conduct high-value research in China, thus hampering patent quality. Specifically, ambiguity with regards to the scope of the legal liability for “reasonable” inventor remuneration in different situations (e.g. for a foreign-owned R&D centre or contract research) causes uncertainty and thus efficiency losses that somewhat hamper patent creation and undertaking of innovation activities at large.

Other patent-related measures

Current incremental-innovation-centric indigenous innovation policies

Inappropriate IIPs jeopardise patent quality in China. First, while long recognised by economists as important stepping-stones for developing countries to better innovate, it is also clear that an *overly* heavy focus on IIPs encouraging assimilation, absorption, and/or re-innovation (hereafter, for simplicity, referred to interchangeably as incremental innovation policies [which are a prominent type of China’s IIPs]), at worst makes enterprises so reliant on foreign technologies that they are unable to “independently” innovate, let alone produce breakthrough innovations, in the short, mid- and long-term. Second, such policies may be used to justify, or actually interpreted to encourage, development of products and processes in a way that nearly outright encourages infringement; and this can unintentionally increase administrative actions, arbitration, or litigation. Further, it is concerning that such policy advice is explicitly at the heart of judicial approaches to future patent cases as outlined in the *December 16th 2011 Supreme People’s Court (SPC) Opinion*. Third, in some instances, overemphasis on currently conceived Chinese incremental-innovation-style IIPs can indoctrinate the policymaking system in a way that prevents creation and implementation of other more effective innovation policies. These current policies are not only ineffective in stimulating incremental innovation but also ineffective as stepping stones towards breakthrough innovation. While not appearing to be universal across all provinces/municipalities, at least some, for example as illustrated in the *Innovation Promotion Regulations of Guangdong Province* effective in 2012, are seeking to revise their current incremental-innovation-style IIPs in response to this third concern. In general, China could benefit from more reform of inappropriate IIPs.

Other measures

There are a wide variety of other Chinese policies that collectively create a magnified drag on patent quality and innovation in China. Massive government “megaprojects” are used instead of arguably more effective ways to foster key innovations, namely those drawing on comparatively smaller teams. There are a range of financial incentives that given their discriminatory nature can hamper innovation and resulting patent quality including the “national champion” logic explicitly only favouring “big companies” embedded in the Electronics and IT Development Fund (EIDF), a several billion RMB fund. A general lack of transparency in Chinese policy formulation and implementation, which is not fully aligned with China’s WTO commitments on transparency, in effect drags down innovation and linked patent quality. There are also difficulties in coordinating industrial park

initiatives in order to optimally stimulate innovation and produce associated highest-quality patents. Other policies also somewhat drag down innovation and linked patent quality in China.

Select and Abridged Recommendations:

- In all provinces/municipalities, reform the award criteria for and oversight of the patent subsidy application process in line with the more detailed recommendations provided in Chapter 3 of this study.
- In line with the more detailed recommendations in Chapter 3 of this study, IND IP policies linked to subsidies and any other financial preferences, inclusive of WTO-inconsistent financial preferences, should be nullified. Amend the requirements in current IND-IP-based policies to include better determinants of the success of an entity in building quality patents.
- Enact revisions to the criteria for HNTE status as outlined in the detailed recommendations in Chapter 3 of this study.
- Conduct an audit or series of audits, led by the National Auditing Office, on the workings of all major innovation-related funding programs and other key innovation policies in China. This report(s) could be used as the basis for improving related programs and policies, to be discussed in a formal dialogue among SIPO, MoST and other relevant bodies involved in patent and larger innovation strategy and implementation.
- Open at least partially more of China's government-sponsored S&T funding programs to foreign entities. And revise IP restrictions therein to allow project partners to own the knowledge produced from the projects, and beyond this simply require that the project partners reach an agreement among themselves on IP ownership and licensing.
- Establish a Working Group with topical sub-groups made up of government officials, Standard-Setting Organisations (SSOs), industry representatives (foreign and domestic), and other experts to investigate and provide recommendations on improving standard-development and oversight policy in China. One of the group's end goals would be to ensure all overly discriminatory *de jure* and *de facto* restrictions on foreign entities accessing the Technical Committees in which standardisation is decided are removed, and more reasonable access is granted to patent pools and essential patents.
- A taskforce should be created among industry associations in China (foreign and Chinese) to conduct an audit of all raw deals and other forms of forced-disclosure of know-how their members have experienced. A dialogue with MOFCOM could be set up to discuss and address their findings.
- Revise several components of the *TIER* in line with the specific recommendations in Chapter 3 of this study.

Chapter 4: Rules and procedures for reviewing patent applications and those for enforcing patents

There are a variety of concerns surrounding rules and procedures for patent application review and those for enforcement of disputes that can discourage building of quality patents and related innovation in China.

Patent application-specific issues

Confidentiality Review process

The *Patent Law* (2008) in China and its implementing rules set forth an overly burdensome Confidentiality Review process for all foreign patent filings for inventions made in China's territory. According to the *Implementing Rules of the Patent Law* amended in January 2010, if it is determined that a solution "may relate to the security or vital interest of the State and is required to be kept secret," a confidentiality notice is sent to the applicant with which they have to comply, and the patent will not be published (even if approved in China) and it cannot be filed in a foreign country. The level of ambiguity as to what constitutes a solution that "relates to the security or vital interest of the State" opens up the possibility that a wide-range of solutions might fall within this category and thus face complications. Further, even if the Confidentiality Review reveals no problem for first filings abroad, as should be the case in most instances, the requirements for this review create a burden because the texts for the review need to be translated or a costly Patent Cooperation Treaty (PCT) application has to be filed with SIPO by external counsel in order to comply with SIPO's request. Even more troublesome is the requirement that patent applications that are amended shortly before foreign filings within the 12 month priority period need another Confidentiality Review as such amendments need to be checked even if in the scope of the original claims.

Green channel process

Uncertainties in application of the expedited examination of patents/the "green channel" approval of patents may somewhat discourage patent quality. The most pressing concern worth discussing is how SIPO will keep track of and take into account the pending applications which have not been prioritised but of course may still constitute relevant *prior art* for any expedited application. It will also be helpful to discuss ways to ensure that recent policy initiatives allowing green channel approval of patents in strategic industries do not translate into an approval mechanism for low-quality patents just because they are in an industry defined as strategic.

Patentability in agro-sciences

There are a number of restrictions on core inventions in the biotechnology field for agro-sciences. For example, SIPO's *Patent Examination Guidelines* (2010 revision) largely exclude genetically modified plants from patentability in China and limit protection of genetic material to a non-meaningful, overly narrow, scope, which clearly prohibits building of quality patents in these areas.

Patent-specific enforcement issues

Abuse of patent rights

Given weaknesses in application of the specific principles of "abuse of right of action" and therein "malicious prosecution action" in cases involving complex patents and ambiguity in the scope of patent claims, complainants in some patent cases can force accused infringers to undertake overly

strong liability. This provides a perverse incentive for litigation that deters development of quality patents and linked innovation. Some sources go as far as to suggest that over 50% of patents in China are filed for the sole purpose of being used for retaliation and/or to first initiate litigation. These concerns, where patents are used as first-attack and/or tit-for-tat weapons, make businesses reluctant to establish or expand operations in China, especially IP-based operations. While it deserves to be recognised that there is a commendable recent focus from the Chinese government on addressing the phenomenon of abuse of patent rights, for example via the *December 16th 2011 SPC Opinion* and statements from SIPO, it appears more still needs to be done to fully address this area.

Prior art submissions in utility model invalidation cases, and prior art review in infringement cases

Under the *Patent Examination Guidelines* (2010 revision), petitioners are sometimes restricted to presenting too few pieces of *prior art* in an attempt to prove lack of inventiveness in a utility model invalidation case. This restriction on pieces of admissible *prior art* for utility model infringement cases can make it notably more difficult to invalidate utility models than invention patents, as it normally requires one or two pieces of “knock-out *prior art*” to show that the utility model has been anticipated.

In a related vein, sources suggest that, in an infringement case, SIPO’s Patent Evaluation Report assessing *prior art* for utility models is currently overly limited to the art in the identical technical field. And this is compounded by what sources suggest to be SIPO’s examiners’ lack of easy access to information on the larger amount of *prior art* disclosed by use or other methods that are not part of patent litigation materials.

Judicial review of Patent Evaluation Reports

Not enough weight is given to Patent Evaluation Reports in infringement proceedings, reinforcing the perception that China has a less than optimal patent adjudication system. In an infringement proceeding in China, the Patent Evaluation Report for utility models is only considered “evidence” and not necessarily binding. This is significantly problematic as it undermines the expert Patent Evaluation Report of SIPO examiners, which while facing some limitations (as discussed above) is still arguably one of the best tools assessing patentability of a utility model, in favour of different types of other potentially dubious evidence in patent enforcement cases. Also, it is concerning that while most judges require utility model patent infringement cases in court be suspended or adjourned pending the outcome of validity proceedings at the PRB, this requirement is not universally applied.

Anti-Monopoly Law

There is continued uncertainty over how Article 55 of the *Anti-Monopoly Law* (AML), which discusses regulation of monopolistic behaviour based on IPR, will be implemented in practice, which in turn somewhat creates a drag on developing quality patents. Anti-monopoly enforcement is important in breaking-up monopoly-building from certain types of patent pools (although in some circumstances patent pools can in fact create positive impacts on patent quality), related behaviour stemming from the discriminatory standardisation process, amongst other practices. The absence of improved regulation herein can deter innovation investments and resulting quality patents.

Protection of process patents

It is very difficult for rights-holders to prove infringement of process patents (which are only granted under invention patents), and thus adequately protect such patents given lack of access to evidence/appropriate evidence preservation protocols in patent process cases. Difficulties enforcing process patents drag down patent quality and innovation at large as protection of process patents is important to stimulate not just process innovation but also subsequently related product innovation. Further, the importance of process patent protection in China as a basis to stimulate innovation will likely grow in the future.

Obtaining preliminary injunctions

Difficulties in obtaining preliminary injunctions (PIs) in China can hamper development of quality patents and related innovation. The *December 16th 2011 SPC Opinion* may encourage reluctance in granting PIs in IP cases, which could particularly harm development of quality patents in the pharmaceutical industry. With a “Bolar exemption” and no strong patent linkage, the pharmaceutical industry may need to rely on PIs if generics enter the market well before patent expiry; and if PIs are rejected because the simple chemical analysis for determining the content of a patented compound is considered to be “technically complex,” generics will not be estopped from sale and prices may be influenced significantly even before patent expiry. While these concerns reflect a challenge to developing quality innovations in the pharmaceutical sector in particular, they can also have a larger impact on innovations and linked patents in China in other fields if even simple technical cases are denied PIs in practice. More generally, industry in China face both difficulties obtaining PIs before a potentially infringing good enters the market and a burdensome threshold for obtaining PIs, which can somewhat deter building of quality patents and related innovation.

Other patent-related issues

Rules and procedures on evidence

Evidence preservation orders in China can be relatively ineffective, which degrades the strength of the IP enforcement environment in China, patents inclusive, discouraging patent-building and related innovation. In practice, defendants often refuse to co-operate with the request to produce documents even after an evidence preservation order is granted by the court, and there is limited recourse for the IP owner to deal with this situation. This reinforces concerns over China’s patent adjudication environment, thus deterring patent-building and related innovation.

Other issues

A range of other factors make it particularly difficult to enforce patent rights in China, which exacerbate the often negative image of the country’s IPR enforcement environment and in turn somewhat hamper building of quality patents and related innovation in China. Such factors include lack of publication of patent case decisions, which conflict with publication requirements in Article 63 of *TRIPS*; reluctance of the Public Security Bureau to acknowledge when criminal prosecution thresholds for IPR infringement have been reached and accept cases therein, high prosecution thresholds in the first-place, and too small penalties for such prosecutions; burdensome rules on notarisation and legalisation of evidence and other materials (which are often essential in IPR cases and enforcement actions) that appear to conflict with Article 41.2, 41.22, 44 and 50 of *TRIPS*; and unreasonable requirements that make it difficult for rights holders to enforce their patent rights at trade fairs. Other IPR enforcement difficulties also hamper patent quality and related innovation in China.

Select and Abridged Recommendations:

- Set forth several specific reforms to ensure reliability and compliance with patentability requirements within the prioritised patent examination process.
- Formulate guidance in line with the detailed recommendations in Chapter 4 of this study that better defines the concept of “abuse of patent right.”
- Create better disincentives for patent applicants to file “abnormal” applications (Fēi zhèngcháng zhuānlì shēnqǐn/非正常专利申请) and bad faith applications.
- Mandate that Patent Evaluation Reports (for utility models) are presumed as fully valid in all court infringement proceedings and moreover given substantial weight in such proceedings, unless, through a formal process, a judge demonstrates deviation from this requirement is necessary to appropriately adjudicate the case.
- When an applicant has submitted more than one or two pieces of *prior art* in the course of a utility model invalidation proceeding, the PRB should be explicitly required to consider such *prior art* when assessing patentability of the utility model. This requires revising the *Guidelines for Patent Examination (2010 revision)*.
- Develop appropriate guidelines on how Article 55 of the *Anti-Monopoly Law* will be implemented to regulate IPR issues.
- Enact specific revisions to adjudication rules surrounding process patents as set out in Chapter 4 of this study.
- Revise Article 16 of the *December 16th 2011 SPC Opinion* to clarify if circumstances where a claimed compound is found in the accused infringers product constitutes an infringement and therefore if preliminary injunctions in such instances are obtainable. Also, develop guidance to encourage judges to grant more necessary preliminary injunctions in patent cases at large.

Conclusion

The Chinese government clearly desires to stimulate innovation in China and has already undertaken many commendable initiatives to try and improve the country’s innovation system, inclusive of its patent quality situation. Still, it is essential to realise that China’s patent quality problem is systemic: it goes far beyond the often cited reasons of patent filing subsidies and occasional tax incentives, having roots in a wide range of policies and other measures, as well as administrative and enforcement approaches, that do not seem to be effectively addressed at present, nor on course to be effectively addressed, and in some cases are not even discussed at all. Individually, and much more so collectively, these dulling devices create a vicious cycle which inhibits patent quality and innovation at large in China. Only when these effects are recognised to be a product of a large network of patent-related issues can China’s institutional and regulatory environment for innovation be understood and systematically improved.

This study is intended as a discussion piece about certain practical ways to in the near future (as distinguished from certain changes to the educational system, culture of risk-taking, and credit system which are arguably less practical in the near term) maximise China’s innovation and related

patent quality potential. To be sure, it is clear that China possesses great innovation potential; however, overall, China still lags behind many developed countries in terms of innovation at large and quality patents in particular, let alone breakthrough innovation and highest-quality patents. While China may indeed be able to largely sustain its economy in the mid-term, i.e. the next five to ten years, through incremental innovation, the efficiency and effectiveness of certain policies, other measures, and practices meant to stimulate such innovation and the quality of patents produced therein deserve notable improvement. Moreover, it is clear that policymakers want to increasingly build breakthrough innovation capacity as distinct from incremental innovation, realising that in the long-term this type of innovation is essential to grow the economy. However, the efficiency and effectiveness of a variety of Chinese policies, other measures, and practices intended to stimulate breakthrough innovation and the highest-quality patents produced therein deserve serious improvement. This study attempts to flag many of these areas needing improvement and provide practical recommendations for doing so.

The European Union Chamber of Commerce in China looks forward to a productive discussion with Chinese officials on the issues and suggestions presented in this study. It is hoped that these efforts will help sharpen China's patent and larger innovation ecosystem into one that will sustainably drive its economy and provide for its people, as well as attract European businesses.

I Introduction

I .1 Key terms

Introduction: This sub-section defines key terms used throughout this study. It first defines different types of innovation, what types of patents can be filed in China, how patents and patent quality are related to innovation, and sets out definitions of different thresholds of patent quality.

I .1.1 Innovation vs. invention

There is a difference between innovation and invention, although this difference is often confused. The terms are defined as follows:

- **“Invention”** is the creation of something considered new (e.g. in the form of a physical product, service, or method).
- **“Innovation”** is the collective act of inventing and the exploitation of that invention.⁵

As such, if an invention is not applied, for example is not introduced to the market and thus given a practical purpose, it is not part of a complete cycle considered “innovation.”

I .1.2 Types of innovation

Innovation is described in an array of economic literature as an important economic driver.⁶ This study refers to two main recognised categories of innovation defined below.⁷

- **“Breakthrough innovation”** (which may also be called “radical” or “discontinuous” innovation) is creation of brand new/cutting-edge innovations. Breakthrough innovations often have the potential to create completely new markets and/or displace existing innovations.
- **“Incremental innovation”** is exploitation of existing innovations in a way that improves upon them, but less dramatically than via breakthrough innovation. Incremental innovation involves less risk and takes less time than breakthrough innovation, resulting in solutions considered less cutting-edge than those from breakthrough innovation.⁸

Both of the aforementioned types of innovation have value. Incremental innovation is used hand-in-hand with breakthrough innovation, for example a successful breakthrough innovation is often followed by a number of innovations incrementally improving its performance or extending its application. While incremental innovation is important, a balance between such innovation and breakthrough innovation is important, whereas the latter typically affords an innovator a much higher level of competitiveness.⁹ Generally speaking, breakthrough innovation is found more so in developed economies than developing ones; and developing economies rely proportionally more on

⁵ Amongst numerous other sources discussing the distinction between invention and innovation see: *Managing creativity and innovation: Practical strategies to encourage creativity*. (2003). Harvard Business Essentials. Boston, MA: Harvard Business School Publishing Corporation; and Bessant, J. et al. (2010). *Beyond light bulbs and pipelines: Leading and nurturing innovation in the public sector*. Report Commissioned by the UK Cabinet Office and Department for Business, Innovation & Skills. Sunningdale Institute. p. 8

⁶ Among others, see Schumpeter’s theory of creative destruction in: Schumpeter, J. (1942). *Capitalism, socialism, and democracy*. New York: Harper & Brothers.

⁷ While different categories may be used, these are two types of innovation distinguished as such in relevant literature. For example, among others, see *Managing Creativity and Innovation: Practical Strategies to Encourage Creativity* (2003)

⁸ Definitions compiled by author after review of relevant literature, for example, among others: *Managing Creativity and Innovation: Practical Strategies to Encourage Creativity* (2003)

⁹ Ibid

incremental innovation on their way to become more developed. A variety of measures reviewed in this study reflect the Chinese government's desire to first and foremost foster indigenously-led incremental innovation, but to also stimulate breakthrough innovation.

Although the distinctions are not focused on at length in this study, it is worth noting that innovation can also be thought of in terms of additional more function-specific categories rather than those representing the degree of innovation. For example, there is both technological innovation and non-technological innovation. Innovation is also often thought of in terms of (1) goods and services innovation (changes in physical products [goods] or services); (2) process innovation (changes in production or delivery methods); (3) organisational innovation (changes in workplace organisation, business practice, or a firm's external relations); and (4) marketing innovation (changes in product design, packaging, placement, pricing, and/or promotion).¹⁰

I .1.3 Patents and patent quality as indicators of innovation

Patents, which are legal rights to exclude others from exploiting (i.e. making, using, or selling) inventions (below see exact definitions of different types of patents in China), are linked to innovation as, while by no means an ideal single indicator, they can be used as an intermediate measure of innovation, i.e. an invention output upon which innovation is built.¹¹ Unfortunately, absolute numbers of patents are often solely used or otherwise overemphasised as a measure of innovation. In fact, the *quality* of patents provides far more insight into innovation capacity as it is a better metric of application of inventions in a way that impacts society.

I .1.4 What types of patents can be filed in China?

Patents, which are legal rights to exclude others from making, using, importing, selling or offering to sell inventions, are granted in three forms in China. These include invention patents, utility model patents and design patents. Definitions of these three types of patents are as follows:

Invention patents can be granted on both products (good and services) and processes, and must meet a standard for novelty (not part of the "*prior art*," i.e. not openly known to the public abroad or in China before their filing date), "inventiveness," and practical use. Invention patents take on average three to five years to grant, a process which includes a detailed examination called a "Substantive Examination." They enjoy protection of 20 years maximum if maintained.

Utility model patents ("utility models") can be granted on the shape and/or structure of a product. They do not undergo a Substantive Examination, but to receive approval are required to be novel, meet a far lower level of "inventiveness" than invention patents, and must meet criteria for practical use/functionality (usually improving the functionality of a product rather than serving as a completely new solution). Utility models are most appropriate for products with lower levels of inventiveness and/or short lifecycles (which require they enter the market quickly) given they have a lower inventiveness threshold, take about one year or even less (e.g. eight to 10 months) to be granted, and enjoy protection of 10 years maximum if maintained. They confer basically the same legal rights in terms of level of protection as invention patents when enforced.

¹⁰ Definitions adapted from, among others: World Intellectual Property Organization [WIPO]. (2011). *World intellectual property report* (p. 23). Retrieved from

http://www.wipo.int/freepublications/en/intproperty/944/wipo_pub_944_2011.pdf

¹¹ Among other sources see: *OECD Stats: Concepts & Classifications, Key statistical concept*

http://stats.oecd.org/oecdstat_metadata/ShowMetadata.aspx?Dataset=PATS_IPC&Coords=&Lang=en

Design patents (also called registered designs) are granted on the appearance of a product that makes it particularly recognisable (i.e. the shape, pattern or their combination, or the combination of colour and shape and/or pattern). Design patents do not undergo a Substantive Examination nor have to meet any technical or functional thresholds, but to be approved must be distinct from prior designs, and in the same vein must not conflict with others' prior rights like copyrights or trademarks. They enjoy protection of 10 years maximum if maintained.¹²

It should be noted that while the aforementioned three types of IPR are considered "patents" in China, not all countries grant these same types of patents. While many countries only grant and consider "patents" to be in line with the abovementioned definition of the Chinese invention patent, a number of other countries outside of China also have utility model and design patent systems which they consider as part of their patent systems. And, in fact, Kardam (2007) suggests that protection of utility models in particular is not uncommon, whereas over 40 countries, including a number in Europe, have a utility model patent system.¹³

I .1.5 What are the definitions of patent "quality" employed in this study?

There has long been a debate on what exactly a definition of "patent quality" should entail. One conventional definition is that patent quality is determined by legal compliance with core statutory requirements for patentability.¹⁴ Others look at the commercial value of a patent,¹⁵ and in the same vein look at patents that are maintained over an extended amount of time such that they can be commercialised to make profits.¹⁶ Yet others suggest that patents that are not commercially valuable can still be of good quality according to statutory criteria.¹⁷ Some use frequency of patent citations in patent literature and also sometimes in non-patent literature as a gauge of the significance of a patent and thus its quality.¹⁸ Some define quality in relative terms, whereas higher quality patents exclusively refer to inventions that would not have been made without the incentive afforded by their patent protection.¹⁹ Yet others, particularly observers of China's patent system, appear to only consider invention patents as of good quality, whereas all non-invention patents (or utility models in particular), are "junk" (low quality). Yet other definitions may be used.

The below Table 2 outlines the definitions for different thresholds of patent quality used in this study in terms of "highest-quality," "quality," and "low-quality" patents:

¹² For one resource on distinguishing the three types of patents in China see: China IPR SME Helpdesk. *Helpdesk ELM 3: Patents* [E-learning module]. Retrieved from <http://www.china-iprhelpdesk.eu/en/e-learning-modules/156-helpdesk-elm-3-patents>

¹³ Kardam, K. S. (2007). *Utility model – A tool for economic and technological development: A case study of Japan*. (pp. 2-3). World Intellectual Property Organization [WIPO] and Japanese Patent Office [JPO]. Retrieved from http://www.training-ipo.go.jp/en/uploads/text_vtr/ws_pdf/kardam.pdf Note: For a listing of countries with utility models and details on their regimes see: Richards, J. (2010). *Utility model protection throughout the world*. Intellectual Property Owner's Association. Retrieved from <http://www.ipo.org/AM/Template.cfm?Template=/CM/ContentDisplay.cfm&ContentID=25244>

¹⁴ Among other see: Scellato, G., Calderini, M., Caviggioli, F., Franzoni, C., Ughetto, E., Kica, E., & Rodriguez, V. (2011). *Study on the quality of the patent system in Europe*. European Commission (p. 19). Retrieved from http://ec.europa.eu/internal_market/indprop/docs/patent/patqual02032011_en.pdf

¹⁵ Ibid

¹⁶ Gao, L., Li, M., Cheng, Y. et al. (2011, September). *Report on the quality of patents for invention in China*. IPR2, European Commission, p. 6, p. 28. Note: in the same sentence the authors also mention that patents are sometimes kept in-force in response to demand of the rights holder's patent strategy as a "technology backup," and are also sometimes kept in-force to prevent competitors from conducting further technical development and research in related areas – although it is not clear from the wording if these are suggested as a criteria for patent quality.

¹⁷ Scellato et al. (2011)

¹⁸ For example, see OECD. (2011). *Competing in the global economy, technology performance: Quality*. In OECD Science, Technology and Industry Scoreboard. Retrieved from http://www.oecd-ilibrary.org/sites/sti_scoreboard-2011-en/06/13/index.html?contentType=/ns/Book,/ns/StatisticalPublication&itemId=/content/book/sti_scoreboard-2011-en&containerItemId=/content/serial/20725345&accessItemIds=&mimeType=text/html

¹⁹ Scellato et al. (2011)

Table 2: Definitions for different thresholds of patent quality used in this study

Threshold	Definition	Measurement
“Highest-quality” patents	<p>(1) Meet or exceed the statutory requirements for patentability in China that best advance Chinese government objectives of sustainably increasing breakthrough research and innovation led by China-based entities (domestic enterprises, research institutions, universities, and individuals as well as foreign-invested enterprises (FIEs)); and</p> <p>(2) Meet criterion (2) for “Quality” patents (see below definition)</p>	<p>Rates of granted invention patents that are not subsequently invalidated; and Same metrics used for criterion (2) for “Quality” patents (see below mentioned metrics)</p> <p>(Note: See below “How do utility models and design patents in particular fit into these definitions?” and Box 1 for further explanations on why these metrics look at invention patents rather than utility models and design patents.)</p>
“Quality” patents	<p>(1) Meet or exceed the statutory requirements for patentability (for invention patents, utility models, and design patents) in China; and</p> <p>(2) Have reasonable prospects of (i) ultimately being commercialised OR (ii) otherwise being transformed to contribute to social, economic and/or environmental ‘progress’ in China (e.g. used to build key knowledge in the field of nationally-sponsored disease research)*</p>	<p>Rates of granted patents (invention, utility model, and design patent) that are not subsequently invalidated nor would likely be invalidated if the enforcement system for patents were improved in line with the recommendations in Chapter 4 hereto; and</p> <p>Rates of commercialisation of patents and/or rates of patents transformed to contribute to progress in China as measured by patents in-force, average patent life-spans, patent citations, survey data, and/or empirical statistical and econometric analyses</p>
“Low-quality” patents	<p>(1)-(2) Those that do not meet the aforementioned standard for “Quality” patents</p>	<p>Rates of patents (invention, utility model, and design) granted but subsequently invalidated and for which this invalidation is not overturned in a re-examination procedure; and</p> <p>Rates of patents not efficiently and effectively commercialised or otherwise not transformed to contribute to progress in China as measured by patents in-force, average patent life-spans, patent citations, usage in malicious prosecution actions, survey data, and/or empirical statistical and econometric analyses</p>

Source: Author’s own definitions after review of relevant literature and consultations with experts in the field. *Note: The definition of ‘progress’ herein is intentionally left relatively open, whereas there may be a wide variety of patents argued to have value of the type directly or indirectly contributing to economic, social and/or environmental progress, and it is not the intention of this study to define all possible instances of this, some of which may be very case-specific. Additionally, it

should be noted that, for a variety of reasons, not all innovations that might contribute to economic, social, and/or environmental progress are patentable.

Although broad tools for measuring the types of patents defined in Table 2 above are also set out in that table, and although some of these tools are employed in the statistical analysis in Chapter 1 of this study, it is not the intention of this study to attempt a thorough quantitative assessment of exactly how many patents in China fit within the different aforementioned thresholds for highest-quality, quality or low-quality. This said, some *rough* quantitative estimates are provided in Chapter 1 for “less-than-highest-quality-patents,” i.e. those that do not meet the threshold for highest-quality.

I .2 Key background information

Introduction: This sub-section provides an overview of information that must be known before starting a new investigation into China’s patent quality situation. It shows that China is not the only country with a patent quality problem; reviews relevant research already available for assessing patent quality in China; discusses how utility models, design patents, and invention patents fit into the definitions of patent quality used in this study; discusses the consequences of proliferation of low-quality vs. quality patents; summarises key patent quality initiatives already being undertaken to date by the Chinese government; provides comments on the first formal study on patent quality in China; and defines the focus of this study.

I .2.1 China is not the only country with a patent quality problem

It is important to recognise that a number of other countries, not just China, face patent quality problems. Developing countries face notable patent quality problems. And even developed countries like the US and those in Europe, for example, have been criticised for their proliferation of low-quality patents.²⁰ As mentioned later in this section, the Chinese authorities, to their credit in particular, have realised their nation has a patent quality problem and done a commendable job in reflecting the need to address this in many recent policies and other measures.

I .2.2 Relevant research already available for assessing patent quality in China

I .2.2.1 Academic and industry opinion

It is recognised among certain industry experts and academics, Chinese and foreign alike, that China has a patent quality problem. Lu (2011), an article from China’s state-owned media, cites corporate and academic opinions generally find that “over 50% or even 80% of Chinese patents are junk,”²¹ whereas “junk” conventionally means of low-quality.

Gao, Li, Cheng et al. (2011), a report by Chinese academics, discusses how China has a significant amount of low-quality patents, and how these are key contributors to the many negative

²⁰ Among others see: Wagner, P. R. (2009). *Understanding patent quality mechanisms*. Federal Trade Commission. Retrieved from <http://www.ftc.gov/bc/workshops/ipmarketplace/apr17/docs/rwagner2.pdf>; Scellato et al. (2011); and Hilty, R. M. (2009). The role of patent quality in Europe. In *Max Planck Institute for Intellectual Property and Competition Law Research*, 11 (11).

²¹ Lu, J. (2011, March 6). Who is making junk patents? *China Intellectual Property: China Daily*. Retrieved from http://ipr.chinadaily.com.cn/2011-03/06/content_12126586.htm (note: link working when last checked on August 1st 2012)

consequences mentioned later in this section. That report finds that utility models and design patents in China are perceived to be of lower quality than invention patents in China given thresholds inventions must meet to be granted invention patent protection are higher than those utility models and design patents must meet – namely the standard of inventiveness as confirmed by a more rigorous Substantive Examination – and this generally makes invention patents in China higher quality than utility models and design patents. The report cites a recent survey by the Beijing IPR Institute showing 70% of the 156 respondents found the quality of invention patents in China was better than that of utility models in China. This is used to argue that many patents filed in China, particularly utility models, are not of particularly high quality.²²

Gao et al. (2011) also notes that China grants very few “key and essential patents,”²³ roughly in line with the concept of “quality” patents used in this study, in part defining these as patents that are maintained over an extended amount of time such that they can be commercialised to make profits. The authors gauge patent performance by, among other metrics, the rate of patents in-force and the related life-span of patents.²⁴

It is also suggested by Gao et al. (2011) that the quality of invention patents in China is below the average of developed countries, including those in the EU, and thus needs improvement. Additionally, the study suggests that Chinese filers’ invention patents are of lower quality than foreign invention patents filed in China, as gauged by, among other metrics, win-rates in patent litigation.²⁵

In 2012, the Intellectual Property Development and Research Centre (IPDRC), a non-profit academic research unit under China’s State Intellectual Property Office (SIPO), released a ranking of national and regional “patent strength” in China in 2011. More on this ranking is found in the “III.1.1.1.4 Core measures of patent quality” section in Chapter 1.

Other academic sources, like the Organisation for Economic Co-operation and Development (OECD) which constructed a Patent Quality Index that focuses heavily on patent citations, rank China quite poorly on patent quality.²⁶ More on the OECD index and its 2011 scores for China are found in the “III.1.1.1.4 Core measures of patent quality” section in Chapter 1.

While it is worth noting that some other studies suggest the quality of patents in China is improving, the methodology of these studies and presentation of their results deserves scrutiny. In particular, Zhou and Stemberge (2010) track the ratio of Chinese invention patent applications to granted invention patents and reach the conclusion that “*despite the growing use of utility model patents...patent quality is trending up.*”²⁷ First, while the ratio of invention patent applications to granted invention patents can indeed be a method of measuring patent quality, a more rigorous and all-encompassing method could be used, for example along the definitions presented in this study and statistical analysis in Chapter 1. Second, it is arguably misleading not to clearly say the growing

²² Gao et al. (2011) pp 1-127. Note: For context, although not challenging the aforementioned sentiments, it is worth noting that many Association of Southeast Asian Nations (ASEAN) countries do not have an inventive step requirement for utility model patents, and China, even though it does not check this requirement upon first review, does have one. In other words, China’s statutory threshold for utility models is higher than that in many ASEAN countries. (Source: June 14th 2012 - Consultations with Elliot Papageorgiou, Executive and Partner at Rouse Shanghai)

²³ Gao et al. (2011), p. 8

²⁴ Gao et al. (2011), p. 28

²⁵ Gao et al. (2011)

²⁶ OECD (2011)

²⁷ See: China poised to become global innovation leader. (2011, October 19). *Thomas Reuters*. Retrieved from http://thomsonreuters.com/content/news_ideas/white_papers/corporate/patented_in_china_2; and Zhou, E. Y., & Stemberge B. (2010). Patented in China II: The present and future state of innovation in China. *Thomson Reuters*. Retrieved from <http://ip.thomsonreuters.com/content/patented-china-ii>

use of utility model patents as it is currently playing out in China is concerning (this issue is explored through statistical analysis further in Chapter 1 and is discussed further in this Introduction section and in other sections of this study). Further, it is worth noting that the tone in Zhou and Stemberge (2010) contrasts dramatically with Gao et al. (2011), as illustrated already. It also contrasts with Eberhardt et al. (2011), which upon conducting regression analyses of patent data from domestic Chinese invention patents and the equivalent of Chinese invention patents filed by ‘Chinese entities’ at US Patent and Trademark Office (USPTO),²⁸ concludes that China’s “*patent explosion does not reflect a general technological take-off, but the success of an extremely small group of firms [including foreign-invested firms] within a single industry [ICT].*”²⁹

I .2.2.2 Chinese government opinion

Key Chinese officials openly recognise that China has a patent quality problem. For example, during recent meetings like the one on October 28th 2011 between representatives of the European Chamber and SIPO Commissioner Tian Lipu and other senior SIPO officials, such officials expressed concern about the state of patent quality in China, and opened the door to the European Chamber for discussion on ideas for addressing this issue.³⁰ By way of further example, Mao Jinsheng, Director of Intellectual Property Development & Research Centre in SIPO, recently noted at an IP conference that “room for improvement” in patent quality was a key issue facing the IP ecosystem in China.³¹ Ma Weiye, Director General of SIPO’s Patent Department, also noted in a December 2010 conference that “*Our companies should pay much more attention to patent quality instead of only quantity.*”³² Other SIPO officials have recently publicly noted there is a patent quality problem in China.³³

I .2.2.3 Other relevant research and sentiments

It is essential to realise that a variety of economic research and other evidence debunks the idea that utility model patents are always of low-quality. A range of empirical studies show that the utility model system in certain countries like Germany, South Korea, and Taiwan, among other once or currently developing countries, has successfully enabled movement from relatively low levels of innovation and competitiveness as well as poor diffusion of technology in those countries to high levels therein.³⁴ This is in-part because when the life-cycle of a product is quite short (e.g. certain

²⁸ Note: The study measures utility models filed with the USPTO noting the concept of “utility” model in the US is in fact tantamount to China’s concept of invention patents and as such is different than China’s concept of a utility model patent.

²⁹ Source: Eberhardt, M., Helmers, C., & Yu, Z. (2011). *Is the Dragon learning to fly? An analysis of Chinese patent explosion*. Center for the Study of African Economies. Retrieved from <http://www.csaee.ox.ac.uk/workingpapers/pdfs/csaee-wps-2011-15.pdf> p. 2 and 17

Note 1: While only measuring invention patent applications, albeit using a notably different methodology, Eberhardt et al. (2011) does not necessarily come to the same positive conclusions on patent quality as mentioned in Zhou and Stemberge (2010). Note 2: Eberhardt et al. (2011) constructs a “patent productivity” metric which in part forms the basis of the findings therein.

³⁰ 2011, October 28- Meeting at SIPO in Beijing. Other attendees at this meeting include Ms. Song Jiang Hui, SIPO’s Legal Department; Mr. Wu Kai, Deputy Director General of International Cooperation at SIPO; other SIPO officials; and several members of the European Chamber.

³¹ Ockenden, J. (2011, December 5). China must boost patent quality, protection and use, says IP boss. *Blueskies China*. Retrieved from <http://blueskieschina.com/mambo/content/view/303/86/>

³² Ibid

³³ Presentation from Xu H. (2011). *China IP policy research and national IP policy requirement*. [Presentation, slide 9]. SIPO. Retrieved from <http://www.unescap.org/tid/projects/ipep-cn.pdf>

³⁴ Among others see: Kardam, (2007); Odagiri, H., Goto, A., Sunami, A., & Nelson, R. R. (2010). *Intellectual property rights, development, and catch up: An international comparative study*. Oxford University Press. Retrieved from <http://www.oup.com/us/catalog/general/subject/Economics/Developmental/?view=usa&ci=9780199574759>; and Lee, K., Kim, Y. K., & Park, W. G. (2006). *Appropriate intellectual property protection and economic growth in countries at different levels of development*. Retrieved from The American University, College of Arts and Sciences. Retrieved from <http://www.american.edu/cas/faculty/wgpark/upload/Intellectual-Property-Rights.pdf>. Note: Interestingly, Lee and Park

electronics) and/or where small innovative firms are simply not well-monied, a utility model approval process that is comparatively faster and cheaper than the invention patent process best enables innovation.³⁵

I .2.3 How do utility models, design patents, and invention patents fit into the definitions of patent quality used in this study?

This study closely considers the aforementioned sentiments in broadly categorising utility models, design patents, and invention patents in China within the definitions of patent quality set forth in Table 2. The fundamental assertions upon which this study operates, which are in line with the academic and government sentiments mentioned above that are not debunked in the analysis in Chapter 1 hereto, are discussed in Box 1 below.

Box 1: How do utility models, design patents, and invention patents fit into the definitions of patent quality used in this study?

All utility models and design patents in China are not inherently of low-quality.

It is essential to stress that this study does not presume that all utility models and design patents in China are inherently low-quality. This is because some of both types of patents inevitably meet the aforementioned standard for quality patents. Moreover, as mentioned above, this is because of the tested economic value of utility models to developing countries in particular: to be sure, utility models, when used properly, can enable useful forms of innovation, particularly incremental innovation.

However, there appear to be more low-quality utility models than invention patents in China, although this finding requires contextualisation.

While some utility models inevitably meet the standard for quality patents set out in this study and if used properly are clearly useful economic development tools – there appear to be more low-quality utility models than invention patents in China according to invalidation figures and incidences of malicious patent prosecution as further explained in chapters 1 and 4. First, utility models typically face invalidation rates over twice as high as invention patents in China (i.e. 47% vs. 21% of all patents that are challenged in front of the Patent Re-Examination Board (PRB)). On one hand, it is important to note that as a percentage of total patents granted and in terms of absolute numbers, China's invalidation rates for both invention patents and utility models (and design patents) are relatively low even compared to international standards, and thus these numbers alone should not be used to suggest that China has a significant absolute number of low-quality utility model patents; on the other hand, these invalidation rates for utility models would likely be higher if the adjudication system for utility models in China was made more effective. Second, given the potentially higher risk that utility models rather than invention patents may be filed solely for and used in future malicious prosecution actions, they are singled out in this study as potentially being of lower quality on average than invention patents. (Note: A variety of issues surrounding design

(2006) find that patent rights create an incentive to innovate in developed countries, but among developing countries at large do not necessarily create the same incentive; however, the authors find that utility model patents have a positive influence on developing countries innovation, diffusion of technology, and economic growth, as it protects minor, incremental inventions these countries are more equipped to produce.

³⁵ Among others see: Suthersanen, U. (2006). *Utility models and innovation in developing countries*. (UNCTAD Project on IPRs and Sustainable Development, Issue paper No.13). United Nations Conference on Trade and Development. Retrieved from http://www.unctad.org/en/docs/iteipc20066_en.pdf

patents may mean that compared to utility models they do not run the same risk of being, nor is it as exigent to determine to what extent they actually are, low-quality.³⁶⁾

Utility models and design patents in China are generally not of highest-quality, whereas invention patents have a much higher chance of being highest-quality.

While some utility models and design patents inevitably meet the standard for quality patents set out in this study and, for utility models in particular, if used properly are clearly useful economic development tools – they generally fall short of meeting the highest-quality threshold even though they potentially serve as the *stepping stones* towards creating highest-quality patents. This statement does not necessarily also assert that *all* invention patents are of highest-quality (or even quality, unless in line with the definition of “quality” set out herein); however, invention patents have a much higher chance of being highest-quality than utility models and design patents. This is due to the abovementioned reasons as to why there are more low-quality utility models than invention patents, and moreover given that invention patents face a relatively higher threshold for patentability and a relatively more rigorous process (a Substantive Examination) to ensure they meet this threshold when compared to utility models and design patents.³⁷⁾

I .2.4 What are the consequences of proliferation of low quality vs. quality (highest-quality inclusive) patents?

Country-specific impacts

Gao et al. (2011) and Wagner (2009) suggest that proliferation of low-quality patents have serious negative consequences. Collectively, these sources and this study suggest that proliferation of low-quality patents have the following consequences, some of which are closely inter-related:

- (1) First and foremost, given many patents are low quality because they involve inventions which are never exploited, their proliferation represents a growth in time and resources spent on initiatives that lack innovation. (In contrast, growth of quality patents reflects a growth in innovation). This is one indicator that innovation efforts (e.g. commercialisation of inventions) are not optimal.
- (2) Inhibits innovators from becoming properly prepared for international competition.
- (3) Raises business transaction costs (e.g. given uncertainty about the validity of granted patents, scope of granted patents, whether an invention is patentable, and/or whether a patent will be fully enforced).
- (4) Unnecessarily encourages patent disputes.
- (5) “Self-reinforces” the low-quality components of the patent ecosystem, whereas the response of a rational firm to a patent system with a sizeable number of low-quality patents – which more so than a system with better quality patents results in increased litigation, strategic behavior, and general increased uncertainty – is to seek more patents regardless of the quality of such patents.

³⁶⁾ Note 1: Although design patents in China, like utility models, typically also face higher invalidation rates than invention patents (31% vs. 21%), their prevalence in future invalidations if the patent adjudication system in China were to be improved is unclear, and their usage in malicious prosecution actions may be less than utility models, making it less clear that these models run the same risks of being low-quality as utility models. And moreover, overall, given the different nature of what they protect, the concern over what extent design patents are of low-quality may in some ways be less exigent than that over utility models.

³⁷⁾ Note: it is difficult to point to utility model vs. invention patent life-spans and rates of utility models in-force, also gauges of patent quality set out in this study, in a way that while appropriately considering the differences in these two types of patents also shows a clear difference in patent quality between the two; thus these particular metrics are not used to show there are more less-than-highest-quality utility model patents than invention patents.

- (6) Wastes government resources, including those meant to encourage innovation and patents.
- (7) Given all the abovementioned consequences, it generally harms development of innovations, particularly breakthrough innovations, as well as overall development of science & technology (S&T).³⁸

In contrast, proliferation of quality patents, highest-quality patents inclusive, can create notably positive impacts. Development of quality patents, at least inasmuch as it reduces proliferation of low quality patents, minimises the incidences of the abovementioned impacts.³⁹

How are these and other consequences mentioned in this study?

This study shows in closer detail how not only the abovementioned consequences, but others that drag down patent quality and innovation ultimately result from a range of different Chinese policies, other measures, and practices in what is a vicious circle of cause and effect. Although given their intertwined nature it is not always possible to clearly separate their impacts on patent quality as distinct from those on innovation at large, Chapters 2-4 show how these devices collectively create a vicious cycle: they hamper patent quality which then hampers related innovation and vice versa (i.e. hamper components of innovation which then hampers patent quality, which then again further hampers innovation).⁴⁰ To be sure, the study does not stipulate there is a mandatory sequence of first improving patent quality which then improves innovation at large, although this is one possible sequence, rather it finds that reforming the devices discussed will in time likely improve both areas. More generally, these consequences are recognised in the overall conclusion of this study to impact the future of the world economy – inclusive of many businesses, consumers, and governments – given that they effect China’s ability to innovate.

I .2.5 Key patent quality initiatives already being undertaken by the Chinese government

A substantial volume of Chinese policy documents and other measures were reviewed for this study. This research shows that the Chinese authorities have set out an impressive number of initiatives to boost patent quality in China. This section provides a very brief overview of the key initiatives reviewed.

Older policy documents generally related to IPR and patent-specific quality

Although more of an exigent issue recently, IPR quality, patent quality inclusive, has at least generally received Chinese government attention for a notable amount of time. Herein, a range of important policies meant to improve the IPR and innovation framework in China have included the State Council (SC)’s *Guidelines on the National Medium- and Long-Term Program for Science and Technology Development (2006-2020)* (hereafter the “S&T MLP”) issued in 2006,⁴¹ the *2008 National IP Strategy*, issued by the SC on June 5th 2008,⁴² amongst other initiatives.

³⁸ Note 1: Wagner (2009) defines patent quality as the capacity of a patent to meet or exceed statutory standards of patentability and finds that proliferation of low-quality patents creates a wide range of problems. (Consequences of a low-quality patent ecosystem mentioned on pp 5-11). Note 2: Gao et al. (2011) pp 106-109 mention consequences of a low-quality patent ecosystem in China.

³⁹ Wagner (2009)

⁴⁰ Note: As such, when specifically mentioned, the cycle of cause and effect involving both patent quality and larger innovation issues along feedback loops discussed in this study are only intended to be illustrative, not necessarily exhaustive.

⁴¹ Retrieved from: http://www.gov.cn/jrzq/2006-02/09/content_183787.htm; one English translation available here: <http://www.etiea.cn/data/attachment/123%286%29.pdf>.

⁴² Retrieved from: http://english.sipo.gov.cn/laws/developing/200906/t20090616_465239.html

More recent policies discussing patent quality

The Chinese authorities have more recently enacted a range of major policies to address China's patent quality problem (for the sake of highlighting the most recent initiatives herein, this study focuses on major policies from 2011 and 2012, although also reviews a number of important policies from a few years prior). These initiatives both address important issues that underlie the development of IPR in China, inclusive of patents, and China's innovation ecosystem at large. They are also targeted at specific quality issues: for example, within the most major recent provincial/municipal and national-level policies reviewed in this study alone, there are over 80 references to initiatives to improve *future* intellectual property rights (IPR) and/or patent-specific "quality." And this is to say nothing of the massive number of other important provisions reviewed for this study for building patent quality simply not mentioning that specific keyword (for example, provisions for boosting rates of invention patents granted, among numerous other initiatives).

The major recent policies reviewed and referenced herein include the following:

- *National Patent Development Strategy (2011-2020)*, released by SIPO on November 11th 2010 (hereafter also referred to as the "NPDS");⁴³
- Provincial/Municipal 12th Five Year Intellectual Property Plans and equivalent plans (all publicly available recent plans reviewed, whereas most were from 2011)⁴⁴;
- Provincial/Municipal Intellectual Property Strategy Outlines and equivalent strategies (all publically available recent strategies reviewed, whereas most were from 2009, 2010, and 2011⁴⁵);
- *Promotion Plan for the Implementation of the National Intellectual Property Strategy in 2012* (hereafter the "2012 National IP Strategy"), issued by the Inter-Ministerial Joint Conference of China's National IP Strategy Implementation (made up of 28 ministerial members) on April 6th 2012 at the 3rd Plenary Meeting of the Inter-Ministerial Joint Conference, and implemented by the Office of the Inter-Ministerial Joint Conference;⁴⁶ and
- Annual Provincial/Municipal Intellectual Property Implementation/Work Plans and equivalent plans (publically available recent plans reviewed, whereas most were from 2012), meant to implement the more long-term provincial/municipal plans and strategies mentioned above.⁴⁷

Box 2 below provides a very brief summary of the main patent quality issues openly discussed and initiatives being put into action in some form in China through these abovementioned policies. Additionally, a wide selection of important sections of these policies are highlighted and translated into English in the "Introduction" section in the Annex of this report, and many of these sections are specifically referenced throughout Chapters 2-4 of this study.

⁴³ Retrieved from (English version): <http://graphics8.nytimes.com/packages/pdf/business/SIPONatPatentDevStrategy.pdf>

⁴⁴ Note: for simplicity, this reference also includes the strategies of designated "autonomous regions"

⁴⁵ Note: for simplicity, this reference also includes the strategies of designated "autonomous regions"

⁴⁶ English version retrieved from: http://english.sipo.gov.cn/laws/developing/201204/t20120410_667158.html; Official Chinese version at: http://www.sipo.gov.cn/twzb/2012zscqjlsstjih/bjzl/201204/t20120410_667306.html

⁴⁷ Note: for simplicity, this reference also includes the strategies of designated "autonomous regions"

Box 2: Key patent quality initiatives in major recent policies reviewed being put into action in some form in China

Improving the education and training system

Although not only related to patent quality, less than optimal education and training systems are a significant and recognised reason for the lack of human capital needed to build up more quality patents and innovation in China. A variety of the major policy initiatives reviewed for this study have emphasised some solutions herein: for example, to boost Chinese research institutes' attraction of overseas talent, encourage students to study abroad, develop programs to foster creative-thinking in schools, build educational awareness of IP protection, among others. It is also at least being increasingly discussed that much more needs to be done along these lines to truly have a deep impact.

Improving the financial credit system

Another one of the most significant inhibitors to the development of quality patents and innovation in China, which is at least increasingly being addressed, is a credit system that does not appropriately provide credit to the most deserving entities. The current credit system is geared to provide credit to State-Owned Enterprises (SOEs) at subsidised interest rates, far from being set by market forces, in effect excluding smaller private enterprises from being offered credit.⁴⁸ More specifically, the system is not developed to a level that identifies and properly funds entities with breakthrough inventions and solid innovation capacity.

Recent regulations and major policy statements reviewed for this study have set forth a variety of initiatives in an attempt to better shore up and provide credit to build IP. These include generally improving the availability and offering of credit, as well as more specific initiatives, for example the development of a Patent Bank for funding IPR development; encouraging banks to defuse and control loan risk for better funding IPR development; increasingly accepting IP-based collateral as security for loans; the establishment of venture capital funds for investment in IP-intensive areas; among others. Further, there is evidence that these policies are moving beyond paper and actually being put into practice, for example, CTEX, a Beijing-based government-supported technology exchange is said to be creating an IP Ventures Fund to purchase IP in foreign markets, and the Shanghai Silicon IP Exchange is developing a similar mechanism.⁴⁹

Addressing a wide range of other issues closely related to patent quality

The major policy documents reviewed for this study set-forth a number of other important, albeit in some cases general, initiatives in an attempt to improve the quality of IPR in China, patents inclusive. Major initiatives covered in the documents are summarised below:

- Improve development of IP law, consulting, evaluation, trading, forensic and other intermediary services; as well as raise the number and quality of patent lawyers.
- Set-forth patent-specific quantitative targets.

⁴⁸ Among others see: World Bank. (2012). *China 2030: Building a modern, harmonious, and creative high-income society*. Retrieved from

http://www.wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2012/02/28/000356161_20120228001303/Rendered/PDF/671790WPOP127500China020300complete.pdf

⁴⁹ Note: CTEX and Shanghai Silicon Exchange examples found in: The quality patent challenge facing China and its businesses. (2011, January 20). *IAM Magazine*. Retrieved from <http://www.iam-magazine.com/issues/article.ashx?g=64724577-cf28-4cb1-bad6-c012264ee060>

- Set-forth incentives, including awards, funding schemes, and so on to stimulate the development of IPR, inclusive of or specifically for patents. This includes further developing the subsidy system for patent filings.
- Develop or improve current patent-based performance and evaluation assessment systems.
- Improve IPR dispute settlement mechanisms and otherwise improve the enforcement of patents.
- Improve IPR regulations.
- Build up IP monetisation/valuation tools and IP exchanges (note: point partially mentioned above).
- Improve the less than optimal national and regional patent information service centers. Build up a patent database and retrieval system. Build up an early warning and patent risk assessment centre.
- Develop further initiatives to attract talent with a view to having such talent help develop patented products and services (note: point partially mentioned above).
- Improve efforts to industrialise and sell IP products.
- Improve cooperation with research universities and research institutes, as well as enterprises, to build patents (note: point partially mentioned above).
- Improve clarity in management mechanisms and responsibilities for government departments involved in developing IP, as well as improve cooperation therein. Also, improve training levels of government and business leaders on IPR related issues.
- Build up high-tech development zones and industrial parks that create IP in an effort to create “IP clusters,” create National Patented Technology Incubation Centres and/or other similar initiatives
- Build patent pools.
- Build up the number and quality of conferences and other outreach activities on IP protection, and foster further regional and international exchanges on IP issues.

Snapshot: 2012 National IP Strategy

Given its wide scope and buy-in from multiple government ministries, and given it provides important IP guidance for the year this study was written, it is worth specifically highlighting the patent-quality-related initiatives within China’s *2012 National IP Strategy*. This document sets forth a number of initiatives that reinforce the types of measures already mentioned above. The plan also emphasises, in Part 1 provisions 1-9 specifically, boosting IPR quality in China. And a number of other measures throughout the plan reflect positive attempts to boost patent quality, for example, commitments to set policy that enables better commercialisation and utilisation of service patents,⁵⁰ the commitment of the Ministry of Science and Technology (MoST) to review and improve measures on managing IP in national science and technology projects,⁵¹ commitment to drafting other IP S&T innovation plans,⁵² amongst other measures.⁵³ The plan also designates specific implementing agencies to establish ownership of the provisions. As later explained in certain sections of this study, some of the strategy’s measures might not most effectively boost patent quality, although at least over half appear to be positive developments and show a commitment by the authorities to enact certain measures to build patent quality in China.

⁵⁰ Part 3, measure 22

⁵¹ Part 6, measure 61

⁵² For example, see Part 6, measure 59, which outlines a commitment to draft a *12th Five-Year Special Plan on IP Work of Science and Technology Innovation*. Depending on the contents of this plan, this may be positive or negative in boosting patent quality.

⁵³ For example, Part 1, measure 9 which commits to improving patent applications and getting more qualified patent examiners in the area of national defense.

Source: Author's review of the *NPDS*; Provincial 12th Five Year Intellectual Property Plans, and equivalent plans; Provincial Intellectual Property Strategy Outlines (recent ones mostly from 2009, 2010, and 2011); *Promotion Plan for the Implementation of the National Intellectual Property Strategy in 2012*; Annual Provincial/Municipal Intellectual Property Implementation/Work Plans and equivalent plans (mostly from 2012); and several other major recent IP-specific measures mentioned throughout this study.

Other important measures and opinions

A number of other important recent measures related directly or more indirectly to patent quality have been promulgated recently or are still being drafted. Some measures directly implementing the aforementioned policies appear to have been drafted, and if so those that were readily available were reviewed for this study, and it is certain that the Chinese government will continue to implement further initiatives to follow-up on the aforementioned policies in order to better build patent quality in China.

Although less IP-specific, there are other initiatives that compliment the major IP-specific policies reviewed in improving quality of innovation and patents in China (for example, Article 5, Section VII of the latest *Foreign Investment Industrial Guidance Catalogue (2011 Revision)*,⁵⁴ and *National Medium and Long-term Talent Development Plan (2010-2020)*⁵⁵). Many other non-IPR-quality-specific, but still related, measures have been promulgated which effect the overall IPR environment, inclusive of patents, in China.

This study reviews a number of measures focusing on IPR development, patents inclusive, in “strategic emerging” industries. China’s nationwide 12th Five Year Plan, officially promulgated on March 2011 at the Fifth Plenum of the 17th Central Committee of the Communist Party of China, sets invention patent targets (see Chapter 2). It also importantly defines “strategic emerging” industries in which a variety of implementing measures have sought to build patents. Specifically, Chapter 10, Section 1 of the 12th Five Year Plan defines these industries as follows: “*In the energy conservation and environmental protection industry, focus on the development of key technological equipment for efficient energy conservation, advanced environmental protection and resource recycling, products and services. In the new-generation IT industry, focus on the development of new-generation mobile communication, new-generation Internet, three-network convergence, Internet of things, cloud computing, IC, new displays, high-end software, high-end servers and information services. In the biological industry, focus on the development of biopharmaceuticals, biomedical engineering products, bio-agriculture and bio-manufacturing. In the high-end equipment manufacturing industry, focus on the development of aviation equipment, satellites and application thereof, rail traffic equipment and intelligent manufacturing equipment. In the new energy industry, focus on the development of new-generation nuclear energy and solar energy utilisation, photovoltaic and photo-thermal power generation, and wind power technological equipment, intelligent power grids and biomass energy. In the new material industry, focus on the development of new functional materials, advanced structural materials, high-performance fibers and compound materials, and common basic materials. In the new energy automobile industry, focus on the development of plug-in hybrid electric vehicles, pure electric vehicles and fuel cell automobile technologies.*”⁵⁶ A variety of implementing measures have recently set out to build patents in these

⁵⁴ Whereas the *Foreign Investment Industrial Guidance Catalogue (2011 Revision)*, promulgated by NDRC and MOFCOM on December 24, 2011 and effective on January 30, 2012 “encourages” investment in IP-related services. (See: Article 5, Section VII, “Encouraged,” “Intellectual property services”) Retrieved from <http://www.ndrc.gov.cn/zcfb/zcfbl/2011ling/W020111229379511927834.pdf>

⁵⁵ The *National Medium and Long-term Talent Development Plan (2010-2020)*, and its implementing regulations and otherwise related initiatives, set-up a wide variety of policies to attract foreign talent through preferential housing, insurance, taxation and other policies. This initiative furthers the objective mentioned in Box 2 to attract talent in China that can develop IPR-protected products and services.

⁵⁶ Retrieved from <http://www.scio.gov.cn/zxbd/gdxw/201103/t876235.htm>

specific industries, including many provincial/municipal policies reviewed for this study; the 2012 *National IP Strategy* (i.e. in provisions 10-15); and the *Notice of the General Office of the State Council on Advancing Several Opinions of Ten Departments Including SIPO on Strengthening the Work of IPR in Strategic Emerging Industries* (hereafter the “SC Notice on IPR in Strategic Emerging Industries”), issued on April 28th 2012 by the State Council and other departments.⁵⁷

This study also considers a number of key court rulings and judicial opinions that involve patents. The most prominent of these are from the Supreme People’s Court (SPC), for example a *December 16th 2011 SPC Opinion*.

I .2.6 Comments on Gao et al. (2011), the first formal study on patent quality in China

Gao et al. (2011), commissioned by the European Commission(EC)-funded IPR2 Project and finished in late 2011, appears to be the first detailed study investigating inhibitors of patent quality in China, although by design focuses on the quality of invention patents and only in-passing mentions utility model and design patent quality issues. As mentioned previously, the report finds that the quality of invention patents in China is better than that of utility models and design patents in China. Through a statistical analysis it finds that Chinese entities’ invention patents are of lower quality than foreign invention patents in China, as gauged by granting rates, rates of patents in-force and life-span of the patents, and win-rates in patent litigation.⁵⁸

The report notes that China has problems with the quality of its invention patents for a number of reasons. There are deficiencies in the general innovation capacity and scientific research ability of inventors in China, as well as weak capacity of patent-related professionals in Chinese companies.⁵⁹ There are significant problems with the quality of applications produced by intermediary services, i.e. patent agencies and their patent application writers.⁶⁰ Problems are noted with the level of patent examination by SIPO examiners and lack of condensed information on the *prior art* for use during examination, in addition to concerns over patent invalidation rules.⁶¹ An insufficient level of patent protection is noted as an inhibitor to patent quality.⁶² The report very briefly mentions that there are government policies effecting patent quality in China, particularly patent filing subsidies (although does not go into detail about any other types of policies).⁶³ The report discusses the effects of the patent quality problem in China by listing out problems reflected in patent litigation, and other wider problems.⁶⁴ It then mentions consequences of perpetuating low- quality patents.⁶⁵ The last part of the report provides recommendations to address some of the patent quality problems flagged.⁶⁶

Gao et al. (2011) is an important and seminal report that looks at the patent quality problem in China; however, the report only provides a partial look into the full gamut of patent quality problems in China. As mentioned, by design, that report focuses largely on issues related to invention patents, although in-passing does mention utility and design patent issues and mentions many issues that cross-cut all three types of models. Perhaps intentionally, the report sometimes mentions issues for which the Chinese government appears to be already seriously undertaking initiatives (like those

⁵⁷ Retrieved from: http://www.gov.cn/zwgk/2012-05/02/content_2127881.htm Note: Ten authorities mentioned: SIPO, NDRC, Ministry of Education, MoST, Ministry of Industry and Information Technology (MIIT), SAIC, MoF, MOFCOM, National Copyright Administration of China (NCAC), and Chinese Academy of Sciences (CAS).

⁵⁸ Gao et al. (2011), pp 8-63

⁵⁹ Ibid, pp 64-74

⁶⁰ Ibid, p. 76-78

⁶¹ Ibid, pp 78-83

⁶² Ibid, p. 83-87

⁶³ Ibid, pp 87-89

⁶⁴ Ibid, pp 90-105

⁶⁵ Ibid, pp 106-109

⁶⁶ Ibid, pp 110-127

mentioned in Box 2 above); sometimes seems to blur root causes when mentioning the different contributors to China's patent quality problem; only in-passing mentions certain important issues that are at the root of China's patent quality problem; and in other cases does not mention key issues therein.

I .2.7 The focus of this study: “unaddressed” patent quality issues that can be practically remedied in the near future

In line with the stated focus of this paper in the “Note on research scope” in the Methodology section, this study focuses on key unaddressed institutional and regulatory issues most closely related to patent quality that can be practically remedied in the near future. Herein, most of the issues highlighted in Box 2 above (and, with just a few exceptions, those in Gao et al. (2011)⁶⁷), are not discussed further in this study because (1) they appear, at least with more time, to be on track to improve patent quality in China and/or (2) some of these issues, in particular those related to China's educational and credit systems, even with the proper government buy-in cannot likely be practically remedied in the *near* future.⁶⁸ Still, a number of the initiatives mentioned in Box 2 above (in addition to others) are indeed discussed further in Chapters 2-4 of this study as potential problem areas hampering patent quality in China.⁶⁹

This study uncovers how a network of patent-related policies, other measures, and practices in China collectively hamper both patent quality and innovation at large. These dulling devices are categorised in terms of certain government-set patent targets and indicators (Chapter 2); policies and other measures meant to promote patents (Chapter 3); and rules and procedures for reviewing patent applications and those for enforcing patents (Chapter 4). It also proposes practical recommendations to remedy these shortcomings.

⁶⁷ This study for the European Chamber very briefly mentions a few key reasons behind patent quality problems also emphasised in Gao et al. (2011) (i.e. patent intermediary services, patent filing subsidies, “abuse of patent rights,” Patent Evaluation Reports [although this study takes an alternative perspective on this issue than Gao et al. (2011)], but more importantly further investigates the roots of the patent quality problem in China unaddressed or not addressed in-depth in Gao et al. (2011), namely: government patent indicators, a wide range of patent-related policies, and certain patent review and adjudication issues.

⁶⁸ These issues also involve components more indirectly related to patents and overall can only be resolved in the longer term. For example: The educational issues mentioned are compounded by what sources suggest to be serious academic fraud issues in China, and while there are certain elite universities in China, most people cannot afford them and/or are not considered for admission given the stringency of the university entrance exam, the Gao Kao; and there are a variety of inter-related cultural issues related at least in part to the educational system that stifle independent-thinking and risk-taking. With regards to the credit system, SOEs in a variety of industries are an entrenched interest group in Chinese policymaking, and it remains to be seen how recent initiatives in certain sectors (e.g. banking) will change this situation. Collectively, tackling all these issues requires a wide-range of reforms only realised in the longer term that go far beyond the sphere of patent quality and patent-related policies and practices.

⁶⁹ Note 1: These include patent-specific quantitative targets; incentives, including awards, and funding schemes intended to stimulate the development of IPR, inclusive of or specifically for patents, and including the subsidy system for patent filings; patent-based performance and evaluation assessment systems; and certain efforts to “improve” IPR regulations. Note 2: For most of these issues, short of making allegations that the aforementioned major policies and related measures do not effectively address or are actually detrimental to patent quality, this study suggests that given limited readily available information, further discussion is warranted with the authorities to clarify the details of otherwise concerning related initiatives. Note 3: It is possible that some may consider other initiatives mentioned in the major policies reviewed as “unaddressed” in line with the definition of such in the “note on scope” in this study. As such, certain initiatives mentioned in these major policies that are not reviewed at length in this study may deserve future scrutiny. For example, in several years (e.g. two) it is worth assessing in-depth how initiatives on the development of IP law, consulting, evaluation, trading, forensic and other intermediary services, as well as initiatives to increase the number and quality of patent lawyers, is playing out in China.

I .3 Summary

This section discusses key terms used throughout this study and other key background information. Importantly, it shows that China is not the only country that has a patent quality problem, and the Chinese authorities have realised that this problem exists and taken some commendable initiatives to attempt to address the issue. Considering this, this study seeks only to address problem areas that appear to be inefficiently and/or ineffectively addressed by these important initiatives. It is essential to know this contextual information before a proper assessment on China's patent quality situation can be made.

II Methodology

The methodology of this study is divided into three parts: research, analysis, and recommendations. These parts are summarised below.

II.1 Research

Three basic questions underlie the research performed for this study. The first question, which was broadly answered in the Introduction section, is what fundamental background information is necessary to understand the patent quality situation in China, including what is China already doing to specifically address its patent quality problem? The second question, further discussed in Chapter 1, is how does China measure up on core statistical metrics of patent quality and innovation? The third and main question underling the research performed in this study that is presented in Chapters 2-4, is what are the key institutional and regulatory issues involving patents/patent-quality that hamper innovation in China and both appear largely unaddressed *and* with the right buy-in can be relatively practically remedied in the near future?

Legal and policy, economic, and statistical research was conducted on a substantial volume of both primary and secondary sources. Main primary sources used for original legal and policy research include various Chinese policies and other measures (e.g. laws, regulations, implementing notices, among others) typically found on Chinese government websites or through legal databases (in Chinese, and also those translated into English). Statistical databases from SIPO, WIPO, and others sources were reviewed. A variety of secondary resources, including academic papers, government reports, law firms' and consulting firms' reports, books, European Chamber documents/publications, news articles, among other sources, were reviewed (in Chinese and English). Also, key consultations were conducted with a variety of actors, chiefly members of the European Chamber's IPR Working Group (many names of those consulted have been concealed in citations upon requests to preserve anonymity).

After compiling the initial research, gap analysis was conducted to identify areas in need of further research. Follow-up research was then conducted.

Box 3: Note on research scope: "unaddressed" issues that can be practically remedied in the near future

Gap analysis was used to hone the research on certain key unaddressed institutional and regulatory issues closely related to patents/patent quality (while these policies and practices involve certain reference to patents, by no means are patents the *only* components therein, and in fact they may contain many different important innovation-related components) that hamper innovation in China and with the proper government buy-in can be relatively practically remedied in the near future. Certain "unaddressed" issues herein mean those (a) not appearing from readily available evidence to be undergoing significant enough reforms or (b) already have undergone reforms that have arguably have had enough time to take effect but still remain largely ineffective. (In a few instances, short of making allegations that certain initiatives clearly "do not" effectively address or are actually detrimental to patent quality, the study identifies areas where, given limited readily available information, further discussion is warranted with the authorities to clarify the details of such otherwise concerning initiatives.)

“Key” herein refers to issues deemed most significant. However, and importantly, certain issues mentioned within this study are more significant than others. In general, the *collective* impact of the issues flagged, rather than only the individual impacts of a few policies and practices, are identified as truly creating the most significant impacts on patent quality and innovation in China.

To be sure, it is not the study’s intention to look in-depth into all patent-quality-related issues in China, let alone all innovation-related issues. For example, the Introduction section of the study illustrates that the government is already arguably appropriately addressing a number of patent quality issues, some issues are arguably more difficult than others to remedy in the near future, and some are less significant than others. As mentioned in the Introduction, certain important innovation-building initiatives, like those surrounding reforming the educational system and financial credit system in China, will likely only be adequately resolved in the longer term and are not as specific to the patent-related issues on which this study focuses.

II.2 Analysis

The research was compiled and analysed using a number of different tools, depending on the content of the material, with a view to presenting the best possible answers to the abovementioned questions. Legal analysis was used when reviewing procedural and substantive rules and their application. Management structure and incentive theory analysis was used when reviewing policy documents, for example those involving patent indicators. Applied economic and incentive theory analysis was used when reviewing policy documents, particularly those involving financial incentives. Statistical analysis was used in interpreting a variety of statistical data and trends.

These analyses and the aforementioned research are presented in the Introduction section and Chapters 1-4, and each chapter is organised to include a sub-section of main issues and another sub-section of more auxiliary or broad, yet important, issues flagged. Also, examples of issues that were considered for inclusion in the body of the report but ultimately not included therein are listed in the “Other sample issues” section in the Annex.

II.3 Recommendations

Recommendations were created to accompany the issues discussed in the analysis. This was done by brainstorming, often simply extending the specific types of mentioned analytical methods beyond tools of problem-analysis to tools for creating recommendations. Care was taken to make recommendations practical in the context of China. For readability, according recommendations are put at the end of each chapter, and are divided into “Core Recommendations” for the main issues and “Other Recommendations” for the auxiliary/broader issues mentioned.

III Results

III.1 Chapter 1: Statistical analysis of China's patent quality situation and larger innovation ecosystem

III.1.1 Analysis

III.1.1.1 Sub-section 1.1: Patent filings have exploded, but this has not translated into a proportional rise in patent quality

Introduction: This sub-section explores how China measures up on a wide range of patent statistics⁷⁰ and what this reflects in terms of the patent quality situation in China. Herein, this section finds that the claims made by an increasing number of sources that China's recent patent filing explosion shows it is well on its way to become an impressively innovative economy need better contextualisation, as while patent quality in China is rising in some sense it does not appear to be 'proportionally' keeping pace with patent filings.

III.1.1.1.1 A patent explosion

China has explosively increased its domestic filing of patent applications over the years, becoming the world's top patent filer in 2011, surpassing the US' and Japan's rate of domestic filings.⁷¹ Since 1985, the year the first Chinese *Patent Law* was released and implemented, there has been a significant increase in the number of invention patent, utility model, and design patent filings in China.

This development has likely been enabled by a number of factors. One likely contributor is improvement in regulation surrounding patents, which, among other effects, has led to improvements in the patent review process – for example, the examination period for invention patents has been reduced from 53 months in 2001 to less than half of that in 2010.⁷² A variety of socioeconomic factors (e.g. rise in the educated workforce) and economic competition have likely led to the growing capacity and drive of Chinese entities to file patents. Additionally, as discussed throughout this study, although not necessarily widely measured by empirical evidence, a variety of patent-related incentives and other policies may have in part encouraged this surge in absolute numbers of patents.

Despite this explosion of patents, it is important to keep in mind that China still somewhat lags behind a number of other innovative countries in terms of patent filings per capita. Per capita measures provide necessary context to date, and in the case of patent filings, arguably better reflect penetration rates of invention capacity than absolute patent filings. As one illustration of this trend, Table 3 below illustrates that China's invention patent filings/the equivalent thereof by domestic entities per capita lag behind a sample of other countries.

⁷⁰ Note: As this section relies heavily on patent statistics from SIPO, it is important to note that SIPO's figures for "domestic" filings do not differentiate between filings made by Chinese-controlled entities or certain foreign-invested entities in China.

⁷¹ Lee, C. Y. (2011, December 21). China tops US, Japan to become top patent filer. *Reuters*. Retrieved from

<http://www.reuters.com/article/2011/12/21/us-china-patents-idUSTRE7BK0LQ20111221>

⁷² Gao et al. (2011), p. 13

Table 3: Patent filings by domestic entities in sample countries per capita (2010)

Country	Number of patents filed by domestic entities (equivalent invention patents in China) (WIPO, 2010)	Population (1,000) (OECD, 2010)	Patent filings in country per capita (per 1,000 people)
Japan	290,081	128,057	2.3
US	241,977	309,050	0.8
Germany	47,047	81,777	0.6
Austria	2,424	8,389	0.3
Denmark	1,626	5,548	0.3
China	293,066	1,341,335	0.2

Source: WIPO, OECD; calculations

III.1.1.1.2 Types of patents filed to date

By industry, and service vs. non-service invention

In terms of industries, from 1995-2004, the largest number of domestically filed patents were for machinery, chemicals, and telecommunications equipment, respectively.⁷³ Similarly, in 2010 the highest number of patents filings was concentrated in electrical machinery, digital communication, computer technology, measurement instruments, and pharmaceuticals.⁷⁴

Overall, from 1985-2010, the vast majority of invention patents filed were on service inventions, and, due to the filing habits of domestic filers, most utility and design patents were filed for non-service inventions. This said, while the averages from 1985-2010 provide a general idea of trends in filings, it is worth noting that in recent years domestic filers are filing more service utility models than non-service utility models (e.g. in 2010, 61.1% of domestic enterprises' utility models were for service solutions and 38.9% were for non-service solutions).⁷⁵ It is also worth noting that the vast majority of invention patents "in-force" (a term explained further below in section "III.1.1.1.4 Core measures of patent quality") owned by domestic and foreign entities during time periods reviewed in this study were service patents.⁷⁶

⁷³ Hu, A. G. (2010). Propensity to patent, competition and China's foreign patenting surge. *Research Policy*, Vol. 39, 985-993. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0048733310001101>

⁷⁴ Stembridge, B. (2011). *Chinese patenting: Report on the current state of innovation in China*. Thomson Reuters. Retrieved from <http://ip.thomsonreuters.com/>

⁷⁵ State Intellectual Property Office. (2011, January 25). *Grants for three kinds of patents received from home and abroad (January 2010-December, 2010)*. A SIPO Statistics. Retrieved from http://english.sipo.gov.cn/statistics/gnwsqnb/2010/201101/t20110125_570600.html

⁷⁶ Note: In 2010, out of the patents in-force held by Chinese owners, 81.3% were service inventions (and 18.7% non-service inventions), and out of those held by foreigners, 97.9% were service inventions (and 2.1% were non-service inventions). (Source: Gao et al. [2011], p. 32)

Table 4: Total applications for three patents types received from home and abroad (1985-2010)

May 1985-December 2010									
		Invention		Utility Model		Design		Total	
		Number	%	Number	%	Number	%	Number	%
Total	Sub-total	2,325,012	100.0	2,414,324	100.0	2,298,238	100.0	7,037,574	100.0
	Service	1,825,487	78.5	969,048	40.1	1,011,142	44.0	3,805,677	54.1
	Non-service	499,525	21.5	1,445,276	59.9	1,287,096	56.0	3,231,897	45.9
Domestic	Sub-total	1,429,648	100/61.5	2,397,523	100/99.3	2,173,289	100/94.6	6,000,460	100/85.3
	Service	960,761	67.2	955,832	39.9	891,690	41.0	2,808,283	46.8
	Non-service	468,887	32.8	1,441,691	60.1	1,281,599	59.0	3,192,177	53.2
Foreign	Sub-total	895,364	100/38.5	16,801	100/0.7	124,949	100/5.4	1,037,114	100/14.7
	Service	864,726	96.6	13,216	78.7	119,452	95.6	997,394	96.2
	Non-service	30,638	3.4	3,585	21.3	5,497	4.4	39,720	3.8

Source: Directly adapted from SIPO statistics chart⁷⁷

By type of patent (invention, utility, and design), and origin of filer

It is clear that domestic filers are strongly contributing to China's increased patent filings; however, deeper analysis uncovers a potentially concerning recent trend: in 2010 and 2011, domestic filers drove China's total utility model filings to in fact outpace filings of invention patents. This trend diverges from that during the last decade in terms of having invention patents increasingly replace utility models, reflecting a recent disproportionate rise in less-than-highest-quality patents (even if one assumes all invention patent filings are of highest-quality).⁷⁸ In further illustrating these points, the below sections illustrate trends in average annual growth rates (AAGR) of patent applications to date, and absolute numbers of patent filings to date.

AAGR of applications for different patents in China to date

Despite notable growth of applications for both utility model and invention patent applications, in the last five years in particular, the growth rate of utility model filings has notably outpaced that for invention patent filings and is a trend led by domestic filers. Drawing from calculations in Table 5 and Table 6 below (more calculations are presented in the "Chapter 1" section in the Annex), it is apparent that while total (from foreign and domestic filers) invention patent applications grew at a higher AAGR than utility models from 1997-2001 and from 2002-2006, from 2007-2011 the AAGR of total utility model applications significantly outpaced the AAGR for total invention patent applications. Specifically, from 2007-2011, the AAGR for total utility model applications was 9 percentage points higher than that for total invention patents. Further, from 2007-2011 the AAGR of utility model filings by domestic entities (30%) has been higher than at any other time in the prior

⁷⁷ Retrieved from http://english.sipo.gov.cn/statistics/szslzlj/201101/t20110125_570591.html

⁷⁸ At worst, this increased filing of less-than-highest-quality patents could also include a disproportionate rise in low-quality patents, although more evidence would need to be gathered to better determine if this is happening.

decade. And this rate was higher than the AAGR for domestic entities filings of invention patents during the same period (28%), and exponentially higher than the AAGR for foreign filings of invention patents during the same time period (5%). (Note: while the growth rate of foreign utility model applications was notably high from 2002-2006 [32%] and 2007-2011 [27%], given, as illustrated in the “Chapter 1” section in the Annex, such applications make a relatively insignificant amount of absolute number of utility model filings compared with those from domestic filers, they thus have a very small impact on the total patent filing AAGR.) This reflects that recently there is a trend towards a disproportionate rise in filings of less-than-highest quality patents.

Table 5: Invention patent applications in China: AAGR (%) by filer and five year period

Five year time period	Domestic apps. AAGR	Foreign apps. AAGR	Total (domestic + foreign) AAGR
1997-2001	23	15	18
2002-2006	33	22	27
2007-2011	28	5	21

Source: Calculations in “Chapter 1” in the Annex. All percentages are rounded.

Table 6: Utility model applications in China: AAGR (%) by filer and five year period

Five year time period	Domestic apps. AAGR	Foreign apps. AAGR	Total (domestic + foreign) AAGR
1997-2001	10	15	10
2002-2006	15	32	15
2007-2011	30	27	30

Source: Calculations in “Chapter 1” in the Annex. All percentages are rounded.

A number of trends are visible when analysing the AAGRs for design patent applications (see Table 7 below, and the “Chapter 1” section in the Annex for more details). The AAGR of domestic entities’ filings of design patents fell in 2007-2011 (22%) from the rate in 2002-2006 (27%). The AAGR for foreign entities’ filings of design patents plunged in 2007-2011 (2%) compared with the rates of their filings in 2002-2006 (26%). The AAGR of total design patent applications from 2002-2006 (28%) was higher than the AAGR for total invention patent applications in the same period, and also higher than the total utility model applications during the same period.

Table 7: Design patent applications in China: AAGR (%) by filer and five year period

Five year time period	Domestic apps. AAGR	Foreign apps. AAGR	Total (domestic + foreign) AAGR
1997-2001	21	7	20
2002-2006	27	26	28*
2007-2011	22	2	19

Source: Calculations in “Chapter 1” in the Annex. All percentages are rounded.*Reminder: number due to rounding.

Absolute numbers of filings by type of patent/model to date, and ratios

Further to the above discussion, analysis of absolute numbers of patent filings shows utility models outpacing filings of invention patents in recent years, which is a trend led by domestic filers. Table 8 below illustrates that in terms of absolute numbers, in 2004, for the first time during the sample period of 1996-2011, more total invention patents were filed than total utility models; however, in 2010 and 2011, more total utility models were filed than total invention patents, meaning patent filing trends have recently shifted to pre-2004 type of ratios. (Additionally, the statistics presented in the “Chapter 1” section in the Annex show that from 1996-2011 domestic filers have filed and continue to file overwhelmingly more utility model applications than foreign filers, although this

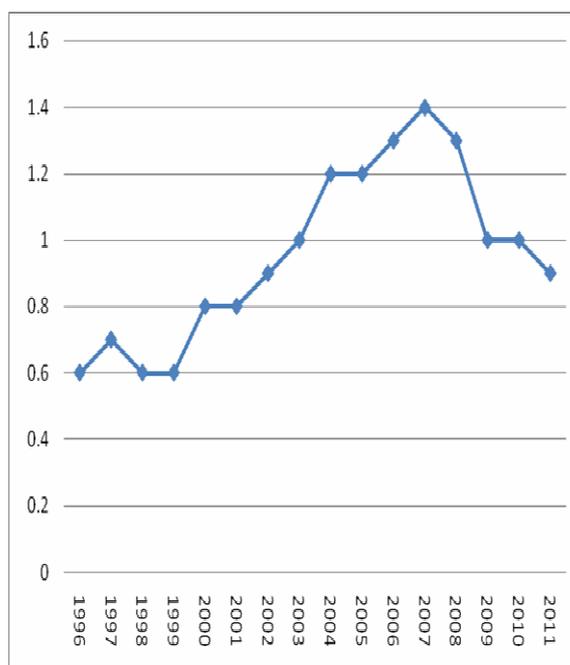
trend, as discussed in the below section “Filing ratios put in an international perspective,” is shared in sampled European countries.) As further illustrated by the ratio of invention patents filings to utility model filings, as shown in Chart 2 below, These trends reflect that China in recent years is witnessing a disproportionately small filing of highest-quality patents.

Table 8: Total (by domestic and foreign filers) invention patent vs. utility model apps. in China (1996-2011)

Year	Invention Patents	Utility Models	Ratio*
1996	28,517	49,604	0.6 : 1
1997	33,666	50,129	0.7 : 1
1998	35,960	51,397	0.6 : 1
1999	36,694	57,492	0.6 : 1
2000	51,747	68,815	0.8 : 1
2001	63,204	79,722	0.8 : 1
2002	80,232	93,139	0.9 : 1
2003	105,318	109,115	1 : 1
2004	130,133	112,825	1.2 : 1
2005	173,327	139,566	1.2 : 1
2006	210,490	161,366	1.3 : 1
2007	245,161	181,324	1.4 : 1
2008	289,838	225,586	1.3 : 1
2009	314,573	310,771	1 : 1
2010	391,177	409,836	1 : 1
2011	526,412	585,467	0.9 : 1

Source: SIPO statistics database; calculations.
*Ratios are approximations.

Chart 2: Total invention patent vs. utility model applications in China by ratio (1996-2011)



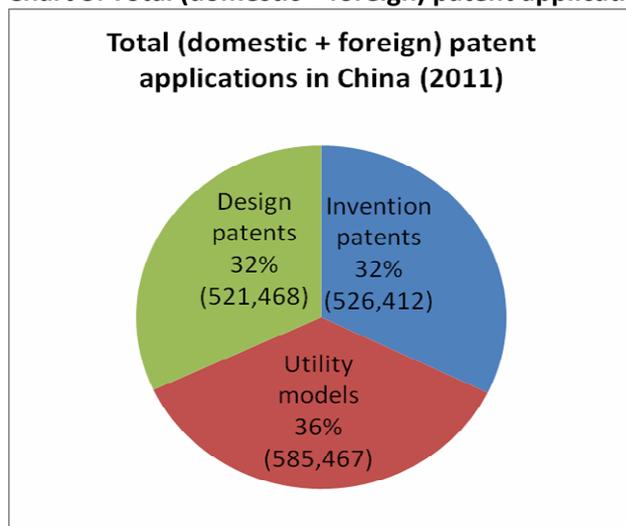
Source: SIPO statistics; calculations. Ratios are approximations

It is also worth noting that domestic filers have filed and continue to file overwhelmingly more design patent applications than foreign filers. For further analysis/comparisons of patent filing trends by type of application and filer, including but not limited to those for design patent applications, see the “Chapter 1” section in the Annex.

Snapshot: Patent filings in China in 2011

Chart 3 illustrates that total utility model applications, which make up 36% of all patent applications filed last year (2011), were 4 percentage points higher than the respective number of invention patent and design patent applications (32% for both) as a proportion of total patent filings. Comparing the absolute numbers directly, there were 11% more total utility model filings than total invention patent filings in China in 2011.

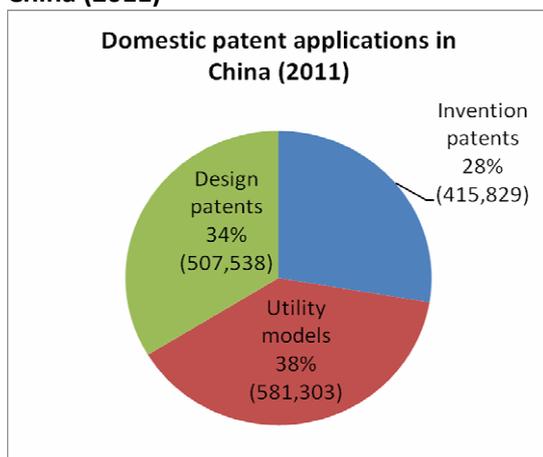
Chart 3: Total (domestic + foreign) patent applications in China (2011)



Source: SIPO statistics; calculations

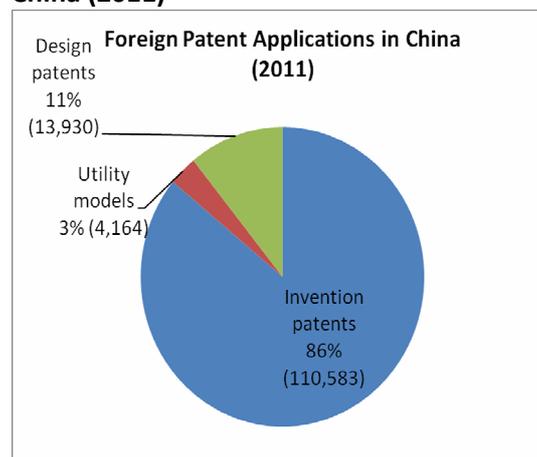
Further, Chart 3 above and Charts 4 and 5 below illustrate that in 2011 domestic applicants led the trend of more utility model applications being filed in China than invention patents or design patents. Chart 4 shows that as a proportion of their total patent filings, domestic applicants filed more utility models than invention patents (and more utility models than design patents). Comparing the absolute numbers directly, domestic applicants filed roughly 40% more utility model than invention patents. Chart 5 shows that the vast majority of foreign patent applications in China in 2011 were for invention patents (86%), whereas only 3% were for utility models (and 11% for designs). This reflects that domestic applicants are largely responsible for the recent disproportionate filing of less-than-highest-quality patents in China.

Chart 4: Domestic patent applications in China (2011)



Source: SIPO statistics; calculations

Chart 5: Foreign patent applications in China (2011)



SIPO statistics; calculations

Filing ratios put in an international perspective

As illustrated in the “Chapter 1” section in the Annex, when comparing the ratio of utility model applications vs. invention patent applications in China to several EU countries with broadly similar patent regimes (in so much as they also protect invention patents, utility models, and design

patents),⁷⁹ it is apparent that patent filings in the EU countries are significantly more geared towards invention patent filings and those are more so led by domestic applicants. In recent years (2008-2010 being the sample period reviewed) more domestic applicants than foreign applicants in Austria, China, Denmark, and Germany filed utility models through their domestic patent offices. However, unlike in China, far more invention patents were filed in the aforementioned EU countries than utility models in terms of both total applications and in terms of those from domestic filers specifically.⁸⁰ Subject to contextualisation about the difference in the countries utility model and invention patent systems, these trends generally reflect that China’s patent filings lean much more towards less-than-highest-quality patents when juxtaposed with a variety of EU countries with broadly comparable patent systems.

Distribution of patents among entities in China

Snapshot: Dispersion of different types of patents by type of company

With some exceptions, invention patents are dispersed across a wide variety of entities in China. Over a 20 year period reviewed, and within a sample of firm data from China’s top 500 companies, Zheng and Lan (2009), found that five corporations -- Huawei Technology Ltd., China Petroleum and Chemical Group, Lenovo, and lastly, ZTE Corporation — accounted for over 60% of all of domestic firms’ invention patents in the sample (see Table 9 below). While this shows a high concentration of patent filings amongst just a few firms in the sample, the sample itself was only representative of less than 5% of total domestic invention patent filings whereas over 95% of invention patents filed in the same 20 year period were from firms outside China’s top 500 firms. This shows a high concentration of invention patent filings among some of China’s top 500 companies, but Zheng and Lan find notable dispersion of the majority of invention patent filings among different domestic entities in China.⁸¹

Table 9: Domestic enterprises with over 200 invention applications during 1984-2004

Corporation	Number
Huawei Technologies Co., Ltd	5,365
China Petroleum & Chemical Ltd.	2,093
China Petroleum and Chemical Group	782
Lenovo Ltd.	745
ZTE Corporation	739
China Petroleum & Chemical Corporation	458
Petro China Company Limited	346
Baosteel Ltd.	325
Haier Ltd.	256

Source: Zheng and Lan (2009)⁸²

Rather than go into an exhaustive analysis, it is sufficient to note that, as further illustrated in the “Chapter 1” section in the Annex, entities with different legal registration statuses in China typically

⁷⁹ Although there are still some notable differences in these countries patent systems which must be considered when making such a comparison.

⁸⁰ Note: these figures are exclusively representative of the aforementioned European countries’ patent filings in their own country’s patent offices, not at the European Patent Office (EPO). As also illustrated in the “Chapter 1” section in the Annex therein, filers originating in those countries can and certainly do also file notable amounts of patents with the EPO.

⁸¹ Zheng, L., & Lan, X. (2009). A tale of two cities: A comparison of patent-based innovative performance of domestic and multinational companies in China. Proceedings of the Joint Symposium of US-China Advanced Technology Trade and Industrial Development. *Journal of International Commerce & Economics*, 3(1), p. 32 Retrieved from

http://www.usitc.gov/journals/entire_journal_2010_11_4.pdf

⁸² Zheng and Lan (2009), Table 4, p. 33

file different percentages of invention patents, utility models, and design patents. By way of one example, the patent filing characteristics of Chinese SOEs are singled out for further discussion in the below section.

SOEs in particular

Chinese SOEs, despite their support from the government, arguably perform less than optimally in terms of producing patented products and services. From one perspective, for example looking at the data in Table 9 above, some Chinese SOEs in fact produce relatively significant numbers of patents. However, this is not widespread across all SOEs in China. According the data and calculations in the “Chapter 1” section in the Annex, in 2009 (2009 is used as a proxy year given it is a recent year and all relevant data is readily available for that year whereas data is not readily available for other recent years), out of all medium- and large-sized domestic-funded Chinese entities, Chinese SOEs accounted for 10% of all patent applications, 9% of all invention patent filings, and 10% of all utility and design patent filings. Their filings of utility and design patents made up 65% of the total number of patent applications they filed that year (35% were for invention patents), which is a higher percentage of utility and design patents than a number of other enterprises with different legal registration, although was also lower than that of a number of other enterprises with different legal registration.⁸³ While on one hand it could be argued that these figures show that SOEs do not file insignificant amounts of patents, they also show that SOEs could certainly be filing more patents, and, importantly – just as a number of other domestic enterprises could – file more invention patents instead of design and utility models. Moreover, Chinese SOEs arguably should be producing better patent figures given the level of financial and other support they enjoy from the government in an attempt to make them innovative and competitive. (R&D figures of Chinese SOEs and their scores on other innovation metrics are mentioned in section “III.1.1.2.1 Fundamental metrics of innovation outside patent statistics”)

International patent filings by China-based entities

International patent applications are a decent measure of the desire of filers to actually use or at least protect their inventions abroad. Patent Cooperation Treaty (PCT) applications and triadic patent applications, among other metrics, gauge international patent filings.

PCT applications – Commendably, China ranks in the top five in the world for PCT applications. It filed a total of 16,406 PCT applications in 2011, at an annual growth rate of 33.4% which was the highest in the world.⁸⁴ Still, this should at least be contextualised in that a few companies, like ZTE and Huawei clearly lead these numbers (see Table 10).

⁸³ Note 1: “State-owned Enterprises” are distinguished in National Bureau of Statistics records from “State Joint Ownership Enterprise” and “State-Sole Funded Corporation.” Note 2: Statistics only readily available for medium- and large-sized enterprises, thus excluding smaller enterprises.

⁸⁴ China IPR (2012, April 5). *China boasts sharpest growth in PCT applications*. Retrieved from http://www.chinaipr.gov.cn/newsarticle/news/government/201204/1287307_1.html

Table 10: PCT Applications Published in 2011, by top 5 applicants

Ranking	Applicant's name	PCT App. Pub. in 2011	Change from 2010 (number)
1	ZTE Corporation	2,826	958
2	Panasonic Corporation	2,463	310
3	Huawei Technologies Co. Ltd.	1,831	304
4	Sharp Kabushiki Kaisha	1,755	469
5	Robert Bosch Corporation	1,518	217

Source: WIPO statistics⁸⁵

DWPI – Outside of PCT filings, another metric to measure “global” filings is the Thomas Reuters Derwent World Patents Index (DWPI), which measures published patent applications in Europe, China, Japan, South Korea, and the US. A 2011 report using this database noted marked rises in Chinese applications in recent years, on the order that will likely soon compete with filings from Japan and the US, the biggest current filers in the DWPI. The report noted that as of 2010, the highest DWPI shares of domestic Chinese applications, i.e. the ratio of Chinese domestic applications to applications in the DWPI, are concentrated in pharmaceuticals (58% in traditional medicines), food chemistry and basic materials chemistry, followed by biotechnology and digital communication.⁸⁶

Triadic patent filings – China does not score particularly well on per capita triadic patent filings, an arguably more appropriate measure of invention capacity than absolute patent filings. OECD (2011b), finds that China ranks comparatively low out of countries sampled (OECD countries as well as several non-OECD countries) in terms of per capita filings of triadic patent family filings, i.e. patents filed at the European Patent Office (EPO), Japan Patent Office (JPO), and US Patent and Trademark Office (USPTO) to protect the same invention.⁸⁷

Other metrics – Also, on yet other metrics of international filings, Chinese enterprises have only been granted a miniscule amount of patents abroad. In fact, sources suggest that patent offices outside China only have granted 1% of their patents to China-based entities, and half of these patents were granted to subsidiaries of foreign multinational enterprises.⁸⁸

III.1.1.1.3 Estimates of patent filings in China in 2015

Not only are patent applications in recent years being dominated more so by utility models than invention patents (or design patents), but, according to calculations in this study illustrated in Chart 6 below, these trends are on course to continue through 2015. In fact, by 2015, it is possible that there will be 39% *more* (over 430,000) total utility model applications than total invention patent applications. This would be 28 percentage points more than the 2011 percentage at which utility model applications outnumbered invention patent applications (11%). When comparing Chart 6 below with Chart 3 above, this estimated 2015 growth in utility model applications (who make up

⁸⁵ WIPO. (2012, March 5). *International patent filings set new record in 2011*. Retrieved from http://www.wipo.int/pressroom/en/articles/2012/article_0001.html

⁸⁶ Stemberge (2011). Note: 58% figure based on calculations from data on p. 15 therein.

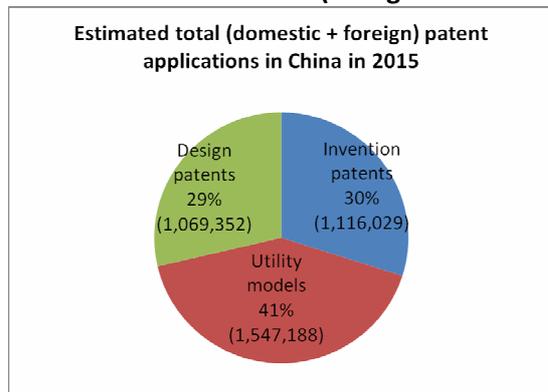
⁸⁷ OECD. (2011b). *OECD Science, Technology and Industry Scoreboard 2011*. OECD Publishing. Retrieved from http://dx.doi.org/10.1787/sti_scoreboard-2011-en. Note: OECD (2011b) finds that triadic filings are typically of higher value and “eliminate biases from home advantage and influence of geographical location.” (p. 45)

⁸⁸ China’s innovation capacities may be over-hyped. (2011, August 7). *International Business Times*. Retrieved from <http://www.ibtimes.com/articles/193820/20110807/china-innovation-railway-patent-education-system-academic-fraud.htm>

41% of total applications) is at the expense of proportionate growth in invention patent (and design patent) applications, whereas invention patent (and design patent) filings as a proportion of total patent filings is predicted to actually fall in 2015 compared to 2011 by 2 percentage points (and 3 percentage points, respectively). In other words, in 2015 invention patents will make up a smaller percentage of total patent filings than they do today while utility models will make up a larger percentage.

By way of further example, the projections suggest there will be over 2.6 million less-than-highest-quality patents filed in 2015 alone. This includes the utility models and design patents for the reasons explained in the Introduction to this study. Even if all the invention patents estimated as being filed in 2015 were considered to be highest-quality patents, this would still mean there would be substantially more less-than-highest-quality patents than highest-quality patents filed in 2015.

Chart 6: Estimated* total (foreign + domestic) patent applications in China in 2015

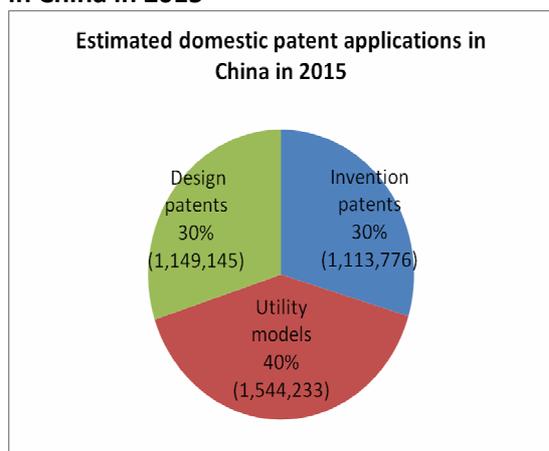


Source: *Methodological Approach A discussed in the “Chapter 1” section of the Annex

Further, the projections find that this increase in the amount of utility model applications as a proportion of total patent applications will be largely led by domestic filers and, notably, foreign filers, albeit a very small contributor, are also predicted to increasingly add to this trend by filing more utility models than invention patents as a proportion of their total patent filings. A comparison of projections in Chart 4 above to Chart 7 below shows the share of domestic utility model filings to total patent filings in 2015 will increase from their share in 2011 (by 2 percentage points, to 40% from 38%), and also the share of domestic invention patent filings in 2015 will increase from their share in 2011 (by 2 percentage points, to 30% from 28%). (The share of domestic design patent filings in 2105 will fall from their share in 2011 by 4 percentage points, to 30% from 34%.) A comparison of Chart 5 above and Chart 8 below shows that foreign contributions to utility model filings as a percentage of all patent applications in 2015 will increase from their rate in 2011 (by 2 percentage points, to 5% from 3%), and foreign filings of invention patents as a share of total foreign patent filings will actually fall (1 percentage point, to 85% from 86%). (Foreign filings of design patents as a share of total foreign patent filings will fall by 1 percentage point, to 10% from 11%.)

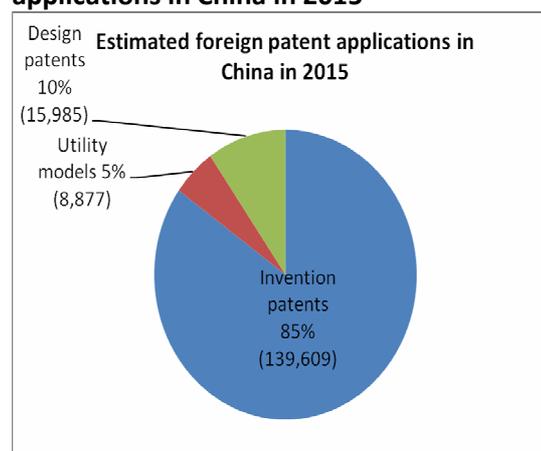
By way of summarising the key trends herein, on one hand, invention patent filings by domestic filers are projected to increase as a percentage of total domestic filings, yet on the other hand utility model filings by domestic filers as a share of total filings will simultaneously increase and exceed invention patent filings. Also, utility model filings by foreigners are projected to increase as a share of their total patent filings and their invention patent filings as a share of their total filings will actually marginally decrease.

Chart 7: Estimated* domestic patent applications in China in 2015



Source: *Methodology Approach A discussed in the “Chapter 1” section in the Annex

Chart 8: Estimated* foreign patent applications in China in 2015



Source: *Methodological Approach A discussed in the “Chapter 1” section in the Annex

Judging from the above figures, while it seems China is commendably on track to meet and very likely exceed major government-set targets for overall patent growth by 2015, it also appears these targets will be met due to a disproportionate growth in utility model applications compared with growth in invention patent (and design patent) applications. 2015 is used as a projection year given it is specifically mentioned as the year by which the main targets in the *NPDS*, and a variety of different provincial/municipal 12th Five Year IP Plans and IP Strategies, are set.⁸⁹ For example, the *NPDS*, issued in November 2010, sets the goal for 2 million annual patent filings in China by 2015. (See Chapter 2 and the “Chapter 2” section in the Annex for detailed information on government-set patent targets.) While it is quite possible the figures presented in the above Charts 6 – 8 are an upper bound, and although calculated based upon past growth rates with all else constant, they are useful to at least generally show that unmitigated there will very likely be some potentially concerning trends in the composition of China’s future patent growth. The projections reflect that not only is China in recent years witnessing a disproportionately small filing of highest-quality patents, but in the near future may very well see this imbalance rise even more. It also should not be ruled out that, at worst, this increased filing of less-than-highest-quality patents may include a concerning rise in low-quality patents. (See the “Chapter 1” section in the Annex for a full description of methodology employed for the calculations used for Charts 6-8, as well as other estimates not presented in this section using different methodological approaches.)

III.1.1.1.4 Core measures of patent quality

Patents granted

Many patents in China never make it past the application stage given high rates of withdrawal and invalidation. Gao et. al (2011) finds that during a 10 year period of time reviewed, 50% of the invention applications filed in China by domestic Chinese applicants were withdrawn.⁹⁰ In 2010, SIPO received 391,177 invention patent applications, whereas 29,448 invention applications were

⁸⁹ Also it is used as it represents the patent filing situation in the near-future although not too distant future (whereas estimating patent composition in the too distant future would face even more estimation uncertainties).

⁹⁰ Gao et al. (2011), p. 20

rejected and 75,949 were withdrawn (105,397 between the two, i.e. about 27% of total applications).⁹¹

In terms of breakdowns among foreign vs. domestic filers, while previously noted that there have been more domestic applications for invention patents in China than foreign ones since 2003, it in fact was not until six years later, in 2009, that invention patents granted to domestic entities outnumbered patents granted to foreign entities. And this was the first time this occurred since 1989.⁹² Further statistical breakdown on numbers of invention patents, utility models, and design patents that are granted from 2006-2011 can be found in the “Chapter 1” section in the Annex.

Looking at a more narrow and recent sample (from 2006-2010), one finds, albeit using a rough proxy-based methodology, that 45% of all patent applications in China are ultimately “not granted” (this term is used hereafter subject to qualifications mentioned in the methodology explained in the “Chapter 1” section in the Annex). Of these patents not ultimately granted, invention patents have the highest rate of not being granted (67%), followed by design patents (38%) and utility models (25%).⁹³ Herein while the high rates of not granting invention patents seems intuitively explained given the higher thresholds required for qualifying for such protection, it is notable that design patents, which do not bear similarly high thresholds to invention patents and in fact have relatively low thresholds, are still granted at notably higher rates than utility models in China.

For context, within the same sample period (2006-2010), China appears to experience roughly similar rates of ultimately not granting invention patents and utility model patents applications when compared to several sample countries in the EU which are known to be innovative. Using the same methodology mentioned (see the “Chapter 1” section in the Annex), China’s 67% rate of not granting invention patents is higher than that of Austria (52%), but lower than that of Denmark (89%) and Germany (72%). China’s 25% rate of not granting utility model patents is higher than Germany (15%) and Austria (23%), but not Denmark (26%).

Patents invalidated

Judging from readily available statistics, China has patent invalidations rates at the same level or perhaps even lower than well developed countries, although it is worth noting that these figures are sometimes debated. SIPO’s 2010 Annual Report suggests that in 2010 the PRB received 2,411 invalidation requests, whereas 21.1% were for invention patents, 47.6% were for utility models (over twice as many as for invention patents), and 31.3% were for design patents.⁹⁴ This translates into a miniscule number of patent invalidation requests let alone resulting invalidations as a percentage of patents that are granted on a yearly basis. The accuracy of these numbers are sometimes questioned.⁹⁵ In the EU, it appears that in 2009 less than 5% of patents filed with the EPO were invalidated.⁹⁶ And in the earlier part of this decade at least, less than 4% of patents in Japan, which has a utility model and invention patent system, were invalidated.⁹⁷ For context, the rates of

⁹¹ Note 1: 12,299 of these filers filed for re-examination. Note: in 2010, 721,753 invention patents were granted, and 564,760 were in-force. (Source: Data from Gao et al. (2011); SIPO statistics.)

⁹² Gao et al. (2011), pp 18-19

⁹³ Note: It should be kept in mind that if a utility model or design patent in China is not granted it is simply because its application is missing some administrative-related components, whereas utility model and design patents do not undergo a Substantive Examination for first approval (like invention patents) as to the merits of their inventiveness and novelty.

⁹⁴ SIPO (2010) *Annual Report: Chapter IV: Patent Application and Examination*, p 48

<http://english.sipo.gov.cn/laws/annualreports/2010/201104/P020110420372588586402.pdf>

⁹⁵ 2012, June 15- Consultations with a patent attorney based in the US

⁹⁶ Wilding, J. (2010). *Statistics for EPO oppositions and appeals – Update*. HLBBshaw Ltd. (p. 1) Retrieved from http://www.hlbbshaw.com/uploads/files/20100716115959_8523.pdf

⁹⁷ Sun, H. (2004). Post-grant patent invalidation in China and in the United States, Europe, and Japan: A Comparative Study. *Fordham Intellectual Property, Media and Entertainment Law Journal*.

subsequently upholding patent validation after an invalidation claim appear to be roughly similar for both the EPO and China's PRB, at around 30% of cases.⁹⁸

Still, and importantly, it is likely that if China's patent enforcement system were improved to be more effective these patent invalidation rates would be higher. For example, if the system were improved in terms of allowing a more appropriate number of pieces of *prior art* to be admissible in invalidation proceedings utility model invalidation rates in particular would likely be higher (see Chapter 4 for more details). This reflects that the scale of China's patent quality problem is larger than that reflected by current invalidation rates alone.

"Patents in-force" and related life-span of patents

Another metric of the quality of the patent ecosystem in China is the rate of "patents in-force," i.e. those that are granted and valid in China. This is one useful metric of the value of patents as it measures patents that have not been invalidated or abandoned by the owner and thus are ostensibly serving some commercial or other use.

There were a large number of patents in-force in China in 2010. Out of 2,216,082 patents in-force in 2010, 82.4% were owned by domestic filers and 17.6% were owned by foreign filers.⁹⁹ Sources tout that 46.4% of Chinese invention patents last over five years,¹⁰⁰ contributing to the aforementioned patent in-force indicator.¹⁰¹

Despite the aforementioned findings, patents in China, particularly those owned by domestic entities, are only maintained for a relatively short amount of time. Gao et al. (2011), reviewing recent statistical trends, find that the average life-span for invention patents awarded to domestic Chinese entities is only 5 years, whereas it is 9 years for foreign-owned invention patents in China.¹⁰² Other data shows that as of 2010 only 4.6% of invention patents in China were maintained for more than 10 years. The typical life-span of utility models owned by Chinese patentees was between 2-4 years, and those owned by foreign patentees was between 2-7 years. The life-span of design patents owned by Chinese patentees was between 1-4 years, and 2-7 years for those owned by foreign patentees.¹⁰³

By way of one comparison, the life-spans of invention patents in China are substantially less than the average life of an equivalent patent in various developed countries sampled for this study. For example, the median life-span of patents in the US is around 12 years.¹⁰⁴ A review of the life-span of

⁹⁸ Widing (2010), p. 1; and China Law & Science Group (2011) "Characteristics and practices of [sic] utility model system in China." p. 12. Note 1: the 30% figure applies to invention patents as well as utility models. Note 2: China Law & Science Group (2011) finds from 2000-2008, the PRB in China *partially* invalidated less than 12% of utility model patents and less than 17% of invention patents in invalidation claims. Note 2: It is not fully clear from all the statistics in these sources if they incorporate invalidated patents that were subsequently re-examined and as a result then maintained.

⁹⁹ China Patent Agent (H.K.) Ltd. Newsletter 2011 Issue 2 (2011), p. 2

¹⁰⁰ SIPO: quality, not numbers, key to patents and innovation. (2011, January 5). *China Daily*. Retrieved from http://www.chinadaily.com.cn/cndy/2011-01/05/content_11794970.htm

¹⁰¹ Note: In 2010, among invention patents filed by Chinese entities, enterprises accounted for 50% of invention patents in-force, research institutes accounted for 9%, universities accounted for 21% (thus 30% for research institutes and universities combined), individuals accounted for 19%, and other "organisations" accounted for 1% of invention patents in-force. (Source: Gao et al. [2011], pp 34-35)

¹⁰² Gao et al. (2011), pp 86-87

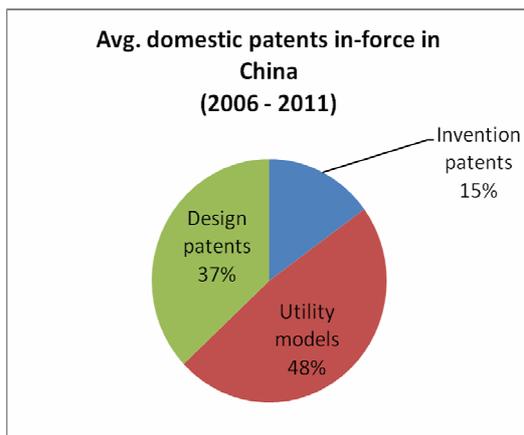
¹⁰³ *Statistics on valid patents in China by 2010*. (2011, April 25). China Science Patent & Trademark Agent Ltd. [CSPTAL] Newsletter, pp. 3-4. Retrieved from <http://www.csptal.com/upload/CSPTAL%20newsletter%20on%20valid%20patent%20201104%20en.pdf>

¹⁰⁴ Sherman, E. (2009). Patent life spans shorter than law allows. *CBS News*. Retrieved from http://www.cbsnews.com/8301-505124_162-43440508/patent-life-spans-shorter-than-law-allows/. Note: it should of course be considered that some patents may be maintained more for litigation purposes than for 'innovation purposes.'

patents by Danguy and Van Pottelsberghe (2009) shows that German patents typically have a life-span of a bit over 12 years, and the typical life-span of Japanese patents is around 17 years.¹⁰⁵ Life-spans of patents granted by the patent office in Finland in recent years are over 11 years.¹⁰⁶ While a number of factors not necessarily related to patent quality partially explain these trends, the figures still likely indicate the number of quality and highest-quality patents in China is, on average, comparatively lower than in these countries.

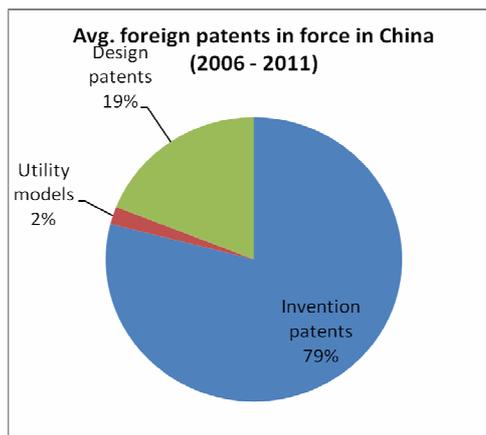
Further, it is strikingly clear that foreigners hold an exponentially higher ratio of invention patents in-force than domestic entities as a proportion of their individual filings, and Chinese entities hold an exponentially higher ratio of utility models and design patents in-force than foreign entities. As illustrated in Chart 9 below, between 2006-2011, out of all patents in-force owned by domestic entities, 85% were not invention patents (i.e. 48% were utility models and 37% were design patents), whereas only 15% of patents in-force owned by domestic entities were invention patents. In contrast, as illustrated in Chart 10 below, during the same time period, out of all foreign patents in-force in China, 79% were for invention patents and only 21% were for utility models (2%) and design patents (19%).¹⁰⁷ These numbers show low rates of invention patents in-force held by domestic filers, who make up the vast majority of patent holdings in China, which additionally confirms that despite China’s patent filing explosion many patents filed in China are likely of less-than-highest-quality.

Chart 9: Domestic patents-in force in China (Avg. 2006-2011)



Source: SIPO statistics; calculations

Chart 10: Foreign patents in-force in China (Avg. 2006-2011)



Source: SIPO statistics; calculations

This said, for context, it is worth noting that there has been a recent uptick in the number of invention patents in-force out of total patents in-force owned by domestic entities.¹⁰⁸ Specifically, domestic entities owned slightly more than 50% of all invention patents in-force in 2011, a change from the past trend of foreign enterprises owning more (see the “Chapter 1” section in the Annex for related statistics).

¹⁰⁵ Danguy, J., & Pottelsberghe, B. V. (2009). Cost-benefit analysis of the community patent. *Bruegel Working Paper*, p. 11, Appendix B, Table C in Appendix. Retrieved from <http://www.bruegel.org/publications/publication-detail/publication/366-cost-benefit-analysis-of-the-community-patent/>

¹⁰⁶ *Annual statistics on patent applications and patents*. (2012). National Board of Patents and Registration of Finland. Retrieved from <http://www.prh.fi/en/patentit/Tilastoja/vuositolastot.html>

¹⁰⁷ Calculations (data source: Gao et al. (2011), p. 30)

¹⁰⁸ This might suggest raising patent quality of patents owned by domestic entities in China, or could just be a natural product of more invention patents being owned by domestic entities and a relative fall in growth rates of new invention patents being filed by foreign applicants.

Patents filed solely for patent litigation/malicious prosecution actions

Some patents serve as tools for “malicious prosecution actions,” those with the sole purpose of being used to litigate and, in doing so, harm another entity. Some sources go as far as to suggest that more than 50% of the patents filed with SIPO “are of foreign innovations with the sole intention of suing the same for patent infringement.”¹⁰⁹ It is worth noting that given utility models are cheaper and easier to obtain than invention patents, it theoretically makes the most sense for applicants to apply for these types of patents if they indeed intend to utilise their patents for the sole purpose of malicious prosecution actions. While in the absence of a detailed analysis of patent litigation (which is difficult in the first place given lack of publication of many patent cases) it is not possible to determine to what extent this phenomenon is playing out, it nonetheless warrants that close attention is paid to the intentions of utility model filers in China.¹¹⁰ (See Chapter 4 for a further discussion herein.)

Patent citations

The frequency of patent citations in patent application literature and also in non-patent application literature can be used as a gauge of the significance of a patent and thus its quality. The idea is that particularly significant patented inventions will be cited more often in patent documents, which must disclose all relevant *prior art*, than less significant patents.

As mentioned in the Introduction section, the OECD sets forth a Patent Quality Index that focuses heavily on patent citations, and this index ranks China quite low. According to the 2011 index, China’s performance from 2000-2010 is ranked below the world average. It is also ranked below the OECD average; below the EU27 average; and as the second lowest out of 25 individual countries highlighted in a report featuring the index, including lower than Brazil (which is a developing country, like China). The index is a composite indicator using six criteria: forward citations (number of citations of a patent); backward citations (number of patents and scientific papers cited by a patent); patent family size (number of countries in which that patent is “taken”); number of claims; “generality index” (dispersion of patent citations over technology classes); and grant lag.¹¹¹ (Note: While patent citations are indeed a useful metric for judging patent quality, methodology qualifications should at least be noted to better contextualise the limitations of such metrics.¹¹²)

IPDRC’s Patent Strength Ranking for China

In 2012, it was announced that the IPDRC, a non-profit academic research unit under SIPO, released a ranking of national and regional patent strength in China in 2011. The ranking uses criteria of patent creation, “patent application,” protection, management, and service. Beijing (1), Shanghai (2), and Guangdong (3) rank in the top three for patent creation; Guangdong (1), Beijing (2) and Jiangsu (3) rank highest in terms of patent application; Guangdong (1), Hunan (2), and Jiangsu (3) rank highest in terms of patent protection; Jiangsu (1), Guangdong (2) and Beijing (3) rank highest in

¹⁰⁹ “China’s Innovation Capacities May be Over-hyped” (2011)

¹¹⁰ Given the different nature of what they protect and the arguably lesser necessity of such models to innovation, this concern may apply less to design patents.

¹¹¹ A further methodological description of the index can be found on p. 1 of OECD (2011). Note: the OECD’s Patent Quality Index shows an average of a 20% decline from average patent quality across the countries reviewed from 1990-2000 vs. 2000-2010. This reflects a digression in patent quality in the aggregate performance of countries reviewed, although it appears China’s performance is only ranked from 2000-2010 (or there is no change in China’s performance during those two time periods).

¹¹² For example, some sources warn of “citation inflation,” whereas the propensity to cite patents increases for reasons unrelated to patent quality (Source: Among others, see Marco, A. C. (2006, July 3). *The dynamics of patent citations* (Working Paper). Retrieved from Vassar College, Department of Economics. Web site: <http://economics.vassar.edu/docs/working-papers/VCEWP84.pdf>

terms of patent management; and Beijing (1), Shanghai (2), and Guangdong (3) rank highest in terms of patent service. Guangdong (1), Beijing (2), and Jiangsu (3) ranked highest overall on the index.¹¹³

Empirical research on foreign firms' patenting decisions in China

Empirical evidence generally shows that weaknesses in China's IPR institutional and regulatory system, in addition to other factors, deter foreign firms from developing and filing highest-quality patents in China. Hu (2008) finds that strengthening of IPR enforcement in China should lessen risk and lead to an increased propensity of foreign firms to patent in China.¹¹⁴ Also, Hu (2008) sets out empirical evidence to support the "competitive threat hypothesis," whereby competing imports in China lead foreign industry to increase patent filings in China; however, Hu finds no strong evidence supporting the "market covering hypothesis" that expansion of an industry's own sales in China raises the propensity to file patents. Hu explains the latter situation in that the incentive to seek patent protection may be offset by the market power of the industry that could encourage it to avoid introducing new technologies to China.¹¹⁵ Hu and Jefferson (2009) find recent surges in patent activity by foreign firms largely take the form of "patenting existing intellectual property that they created elsewhere."¹¹⁶ Additionally, Hu (2010) also finds that a notable number of foreigners develop and file patents in China in response to technology-proximity-based import competition in China.¹¹⁷

III.1.1.2 Sub-section 1.2: Other metrics show innovation in China is impressive, but this often deserves better contextualisation

Introduction: This sub-section explores how China measures-up on a number of innovation metrics not exclusively related to patent statistics, finding that China indeed has a growingly impressive innovation potential although in some senses its actual innovation is perhaps overhyped. This sub-section is by no means exhaustive in the innovation metrics it discusses, and is only intended to give a brief snapshot of China's innovation landscape.

¹¹³ SIPO. (2012, June 19). *SIPO issues the report on overall patent strength*. Retrieved from http://english.sipo.gov.cn/news/official/201206/t20120619_711414.html Note: Unfortunately, while some details are available, full details on the methodology and disaggregated indicator scores for the ranking did not appear to be readily publically available during the writing of this study.

¹¹⁴ Hu, A. G. (2008). *Propensity to patent, competition, and China's foreign patenting surge*. European Policy for Intellectual Property Conference. p. 18. Retrieved from

http://www.epip.eu/conferences/epip03/papers/Hu_China_patents_Hu_Sep08.pdf

¹¹⁵ Ibid, p. 34. Note: Interestingly, Hu (2008) also provides evidence that Chinese firms are more likely to imitate the technology of Japanese, Korean, and Taiwanese firms more so than German and US technology. He explains this may in part be because Chinese firms are more of direct competitors with the aforementioned Asian countries, and at large one might suggest their technology is comparatively "less advanced and fundamental in nature" (p. 23) and thus it is easier for Chinese firms to "absorb" such technology (pp 23-34).

¹¹⁶ Hu, A. G., & Jefferson, G.(2009). A great wall of patents: What is behind China's recent patent explosion? *Journal of Development Economics*, Vol. 90, No. 1, p. 66

<http://faculty.smu.edu/millimet/classes/eco6375/papers/hu%20jefferson.pdf>

¹¹⁷ Hu (2010). Note: Data analysed in this study was from 1995-2004.

III.1.1.2.1 Fundamental metrics of innovation outside patent statistics

R&D expenditures

Overview

R&D expenditures are one useful metric of inputs into innovation in China. Battelle (2011) notes that in 2011 China's gross expenditures on R&D (GERD), which include R&D expenditures by government, business, and higher education institutions, amounted to 1.6% of its GDP. These expenditures are predicted to stay at 1.6% of China's GDP in 2012. In 2011, China's total R&D expenditures represented 13.1% of the world total (with Europe representing 24.5% of the total); and in 2012, China's total R&D expenditures are predicted to reach 14.2% of the world's total (whereas Europe's could drop slightly to 24.1%).¹¹⁸ From 1996-2007, China experienced average annual total R&D growth rates of 22%, the highest in the world.¹¹⁹ R&D investments in China have grown annually at 12% over the last several years, outpacing annual GDP growth by 2-3%.¹²⁰

Other statistics provide more disaggregated details on the levels of R&D in research collaborations and R&D expenditures by Chinese companies in particular, showing they score relatively impressively on some metrics but lag well behind other countries on others. China has the highest percentage of R&D collaborations (16%) if compared with Japan (7%), India (5%), and South Korea (3%).¹²¹ Still, while China has the largest amount of researchers, in terms of per capita researcher within its labour force it scores far below the world average.¹²² As of 2010, there were no Chinese companies among the top 20 global R&D spenders.¹²³ However, in fairness, Huawei and ZTE, two big Chinese companies, are experiencing some of the fastest R&D growth out of any company in the last decade;¹²⁴ and within the top 1,000 R&D spenders in 2009 and among fast growing middle-income countries therein, China clearly leads with the likes of Petro-China Co Ltd., ZTE Corp., China Railway Construction Corp. Ltd., China Petroleum & Chemical Corp., and a laundry list of other Chinese companies.¹²⁵

SOEs in particular

In terms of Chinese SOEs in particular, it could be argued that they do not spend utterly insignificant amounts on R&D, although this amount could certainly be higher particularly given the level of financial and other support they enjoy from the government in an attempt to make them competitive. According to statistics and calculations presented in the "Chapter 1" section in the Annex, out of all medium- and large-sized domestic-funded enterprises in China, Chinese SOEs spent on average 13% of annual R&D expenditures from 2006-2010. During the same time, Chinese SOEs on average employed 15% of the R&D personnel out of all medium- and large-sized domestic-funded enterprises in China.¹²⁶ Chinese SOEs' R&D expenditures are not dispersed equally across all SOEs

¹¹⁸ Battelle. (2011). *2012 global R&D funding forecast*. R&D Magazine. Retrieved from http://battelle.org/docs/default-document-library/2012_global_forecast.pdf?sfvrsn=2

¹¹⁹ Ibid, p. 30

¹²⁰ Ibid, p. 28

¹²¹ Ibid, p. 31

¹²² WIPO (2011), p. 36

¹²³ Ernst, D. (2011). China's innovation policy is a wake-up call for America. *East-West Centre*, p. 8. Retrieved from <http://www.eastwestcenter.org/fileadmin/stored/pdfs/api100.pdf>

¹²⁴ Ernst (2011), p. 10, endnote 29

¹²⁵ WIPO (2011), p. 41

¹²⁶ Source: See data in "Chapter 1" section in the Annex. Note that "State-owned Enterprises" are distinguished in National Bureau of Statistics records from "State Joint Ownership Enterprise" and "State-Sole Funded Corporation." Note 2: Statistics only readily available for medium and large-sized enterprises, thus inferably excluding smaller enterprises.

but concentrated only in some, whereas, for example, by some estimates, 80% of large Chinese SOEs do not have an R&D team and thus inferably not much R&D expenditure.¹²⁷ Generally, according to Chan and Daim (2011), Girma and Gong (2008a), and Girma and Gong (2008b), Chinese SOEs' operations tend to focus on short-term performance rather than risky longer-term investments in R&D and innovative building.¹²⁸ Further, Guan et al. (2006) and OECD (2007) find that overall, despite some exceptions, Chinese SOEs are not particularly efficient in knowledge production and utilising R&D to innovate.¹²⁹

Other metrics

Not all companies rely on R&D, neither abroad nor in China, to boost certain types of technological and also non-technological innovation – and so other metrics are needed to measure this innovation. In middle- and low-income countries it is common for enterprises to invest in machinery and equipment rather than R&D *per se* to build up innovation.¹³⁰ Process and organisational innovation in the services sector are particularly important forms of non-technological innovation that do not require formal R&D but rather other forms of innovation investment.¹³¹ SMEs in particular may innovate without conducting formal R&D.¹³²

Box 4: Distribution of government-sponsored innovation investment

As this section highlights innovation investment metrics, it is also important to mention that not only absolute value of investment is an important metric to gauge innovation, but so is distribution of such investment. Herein China may not measure up as well as perhaps assumed in terms of access to government-sponsored innovation investment in particular. Many Chinese and foreign companies suggest that access to government-sponsored sources of finance is critical in allowing them to boost innovation at large and patent creation and utilisation in particular, and denial of this type of support inferably harms innovation and patent initiatives. For example, survey data from EU companies suggests that outside access to talent, access to public grants, fiscal incentives, and public loans and guarantees are some of the most important factors affecting EU companies' innovation plans and activities.¹³³ Consultations suggest that access to the aforementioned types of financial support is also a key factor affecting many private Chinese companies' innovation plans and activities.¹³⁴ Thus, denial of such support by Chinese funding bodies, which is further discussed in Chapter 3 hereto, hurts innovation at large and building of quality patents in particular.

¹²⁷ Roth, E. (2012) PowerPoint Presentation for European Chamber's May 17th 2012 R&D Conference in Shanghai (citing a statement from Liu Yanhua, Vice Minister of MoST)

¹²⁸ Chan, L., & Daim, T. U. (2011). Technology transfer in China: literature review and policy implications. *Journal of Science and Technology Policy in China*, Vol. 2 Issue.2, pp 122 – 145. Retrieved from <http://www.emeraldinsight.com/journals.htm?articleid=1942785&show=html>; Girma, S., & Gong, Y. (2008a). FDI, linkages and the efficiency of state-owned enterprises in China. *Journal of Development Studies*, Vol. 44, pp 728-49. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/00220380802009233>; Girma, S., & Gong, Y. (2008b). Putting people first? Chinese state-owned enterprises' adjustment to globalization. *International Journal of Industrial Organization*, Vol. 26, pp 573-85. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0167718707000513>

¹²⁹ Guan, Y., Mok, C., Yam, R., Chin, K., & Pun, K. (2006). Technology transfer and innovation performance: evidence from Chinese firms. *Technological forecasting and social change*, Volume 73, pp 666-78. Retrieved from <http://www.mendeley.com/research/technology-transfer-and-innovation-performance-evidence-from-chinese-firms/>; OECD. (2007). *Reviews of innovation policy*. Organisation for Economic Co-operation and Development. Retrieved from <http://www.oecd.org/science/innovationinsciencetechnologyandindustry/oecdreviewsofinnovationpolicy.htm>

¹³⁰ WIPO (2011), p. 42

¹³¹ WIPO (2011), p.34

¹³² WIPO (2011), p. 42

¹³³ European Commission. (2010). *The 2010 EU survey on R&D investment business trends*. Directorate General Research. p. 17 Retrieved from http://iri.jrc.es/research/docs/survey/2010/Survey_2010_final.pdf

¹³⁴ 2012, 25 April - Consultations with certain Chinese R&D managers based in Shanghai

III.1.1.2.2 Certain trends in innovation in China

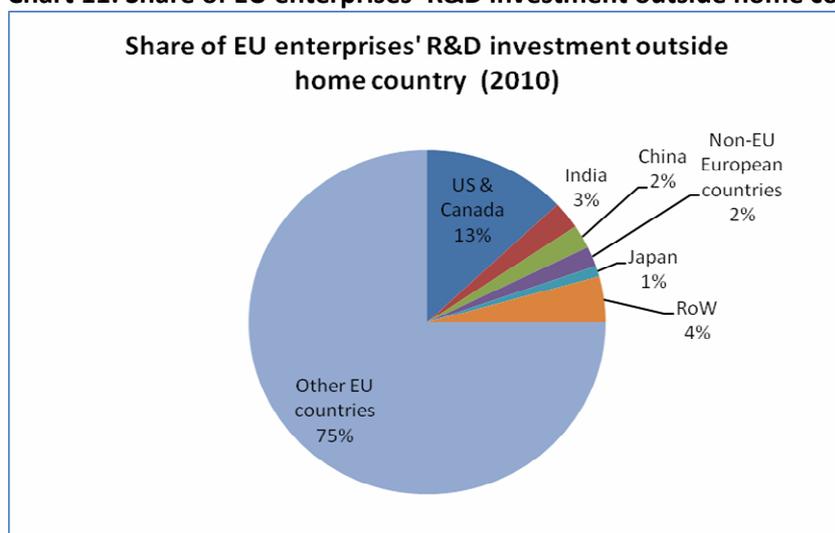
Trends in innovation from foreign entities in China

Innovation spending, development of technology, and tech-transfer

China is becoming an increasingly attractive place for foreign R&D investment. For example, at the end of 2011, there were over 1,400 foreign-invested R&D centres in China, a relatively significant number.¹³⁵ In particular, firms from the EU, US, Japan and Korea invest in R&D operations in China.¹³⁶

In terms of EU firms specifically, surveys suggest that when investing outside of their home country, such firms may invest in R&D activities in China. As illustrated in Chart 11 below, a 2010 EC survey finds that the largest share of EU companies' R&D investments *outside* the EU is concentrated in the US and Canada (13%), India (2.6%), China (2.2%), non-EU European countries (1.9%), Japan (1%), and the Rest of the World (RoW) (4%).¹³⁷ And India and China will see some of the highest growth rates in new innovation-related investment from European (and US) firms in the near future.¹³⁸

Chart 11: Share of EU enterprises' R&D investment outside home country



Source: Data from European Commission (2010)

Nonetheless, survey data of an aggregated sample of representatives from a range of industries suggests outsourcing of R&D to China is typically not a particularly significant innovation activity for the sampled EU companies at present, and the absolute amount of these investments is still relatively low. Specifically, the aforementioned 2010 EC survey finds that “*outsourcing R&D is overall the least relevant activity for innovation*” among the EU firms surveyed, which include those from high R&D-intensity, medium R&D-intensity, and low R&D-intensity firms.¹³⁹ Further, this R&D

¹³⁵ Liu, Y. (2011, December 9). Greater convenience for foreign investors. *China Daily*. Retrieved from http://www.chinadaily.com.cn/business/10thWTO/2011-12/09/content_14240801.htm

¹³⁶ Among others see: Serger, S. *Foreign R&D centres in China: development, drivers, spillovers*. Swedish Institute for Growth Policy Studies. University of Lund. [Presentation]. Retrieved from <http://www.oecd.org/dataoecd/18/16/39244157.pdf>

¹³⁷ European Commission (2010), p. 5

¹³⁸ European Commission. (2009). *The 2009 EU survey on R&D investment business trends*. Directorate General Research. Figure 9, p. 20. Retrieved from <http://iri.jrc.ec.europa.eu/research/docs/survey/2009/JRC60580.pdf>; European Commission (2010), p. 21; and Battelle (2011), p. 27

¹³⁹ European Commission (2010), p. 5

investment in China in particular, while rising in growth terms from around 1% in 2005¹⁴⁰ is not insignificant it is still a meager 2% of the average global R&D expenditures of EU firms surveyed. Also, on average, surveyed EU firms' R&D investment in China is not projected to rise by more than 3% (to about 5% of total R&D expenditures) in 2013.¹⁴¹

Also, survey data shows that China is not receiving particularly significant amounts of non-R&D innovation-related investment from EU firms. European Commission (2010) measures EU-based companies' investments in "knowledge sharing activities" (collaboration, outsourcing and licensing activities)¹⁴² with public and private partners outside their home country and specifically finds the highest concentration of such investments in the US and Canada (14%), RoW (6%), non-EU European countries (4%), and lastly, in China, India, and Japan (roughly 2% each).¹⁴³

Further, academic studies suggest foreign enterprises do not develop breakthrough patented technologies in China given concerns over the IPR environment. Bruun and Bennett (2002) find that foreign companies are particularly concerned about losing the technical lead to China in high-tech sectors through misappropriation or leakage of IPR, which, despite the fact that there may be common interests for cooperation with Chinese entities in the near-term, leads them to be reluctant to develop advanced innovation operations in China. This generally leads companies to keep their core R&D in headquarters or other more IPR-friendly areas, and to disperse their R&D activities in China in order to reduce risks created by IPR infringement of any one unit. Exacerbating this concern is the general lack of transparency in the Chinese legal system.¹⁴⁴ Wu and Pangarkar (2006), who investigated a sample of listed Chinese firms, find that FDI tends to favour low-tech industries in China, and this trend has only slowly changed recently whereas high-tech sectors still particularly lag in S&T development.¹⁴⁵ Asakawa and Som (2008) note that while many foreign companies are keen to expand research operations in China, in practice they have been reluctant to do so due to IPR concerns.¹⁴⁶ Chan et al. (2011) raise issues similar to those in the aforementioned studies.¹⁴⁷ Other studies also reflect these type of concerns, for example, an older study finds that foreign companies transfer technologies to China that are at least five years behind global standards or transfer technologies that would be obsolete in the near future unless certain means can be utilised to protect the technology particularly well.¹⁴⁸

¹⁴⁰ European Commission (2009), p. 20

¹⁴¹ European Commission (2010), p. 13

¹⁴² European Commission (2010), p. 20

¹⁴³ European Commission (2010), p. 6. Note: With the exception of such investments in the US and Canada, these investments in the other mentioned countries are predicted to increase (p. 21)

¹⁴⁴ Bruun, P., & Bennett, D. (2002). Transfer of technology to China: a Scandinavian and European perspective. *European Management Journal*, Vol. 20, pp 98-106. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0263237301001189>

¹⁴⁵ Wu, J., & Pangarkar, N. (2006). Rising to the global challenge: strategies for firms in emerging markets. *Long Range Planning*, Vol. 39, pp 295-313. Retrieved from <http://people.bath.ac.uk/mnsipc/Reading/Asian%20corporations/Chinese%20articles/local%20strat.pdf>

¹⁴⁶ Asakawa, K., & Som, A. (2008). Internationalization of R&D in China and India: conventional wisdom versus reality. *Asia Pacific Journal of Management*, Vol. 25, pp 375-94. <http://www.springerlink.com/content/77648375721p2u28/>

¹⁴⁷ Chan and Daim (2011), pp 122 – 145

¹⁴⁸ For example, see Maskus et al. (1998), the authors of which interviewed managers of a range of foreign enterprises operating in China, who noted they at large do not develop breakthrough technologies in China given concerns over misappropriation of IP and patent infringements. Almost all respondents reported that they transferred technologies that were at least five years behind global standards, or transferred technologies that would be obsolete in the near future, unless certain means could be utilised to protect the technology particularly well. Additionally, concern over weak patent protection in China prevented foreign enterprises from fully integrating their Chinese operations, whereas they typically divided production processes among production sites to avoid revealing the full nature of their operations in any one site. (Source: Maskus, K. E., Dougherty, S. M., & Mertha, A. (1998, September). *Intellectual property rights and economic development in China*.)

Given the above findings – as well as those from Hu (2008), Hu and Jefferson (2009), and Hu (2010) mentioned previously – as an aggregate it appears that foreign entities, despite having some of the highest-quality patents in the world, purposefully do not as a first priority develop breakthrough patented products in China for either the Chinese or foreign markets. This is largely due to perceived weak IPR protection in China, in addition to foreign firms having strong market power.

Additionally, although it deserves to be tested through a fuller investigation of its own, it is the opinion of this study that foreign firms may be particularly reluctant to develop breakthrough patented products in China given the magnitude of the threat of Chinese entities to use illegally acquired IPR from foreign firms to very seriously jeopardise their business operations not just in China but also abroad. Specifically, foreign firms may be reluctant to develop such products in China given concerns over perceived weakness in IPR protection are magnified by the very real possibility that IPR could fall into the hands of a Chinese entity that is able to produce the IPR-protected products and through economies of scale only afforded in China and/or preferential government support very seriously threaten the IPR owners' business operations not just in China but also abroad. This magnitude of this threat arguably exists in China to an extent unparalleled by that associated with other developing countries that have IPR regimes also perceived to be weak.

Still, these findings should be taken in context, as depending on industry and firm there are likely a variety of exceptions to these findings. The promise of tens or hundreds of millions of customers clearly does attract a large number of foreign business operations to China, some of which are undeniably innovating to some extent. There are certain industries, for example the pharmaceutical industry, for which these trends may not play out as described in the aggregated survey data, and may in fact play out in the opposite manner. There are high-tech transfers from foreign companies to operations in China, even if at large these are not of the most breakthrough of such technologies. Also, many of the aforementioned studies do not appear to specifically address introduction of non-technological innovations, which are important forms of innovation in China.

Trends in innovation from Chinese entities

From one standpoint, Chinese entities are admirably becoming more innovative. It is undeniable that China has dramatically improved its innovation capacity over the years, importantly led by a growing number of domestic firms that are well-regarded for being innovative in their own right. Many Chinese companies have innovation-related strengths that many EU companies do not even have in terms of the ability to make quick decisions without going through lengthy internal processes/discussions and the ability to very quickly commercialise products and services and adjust them subsequently to the particular tastes of the Chinese market.¹⁴⁹ Generally, China is adept at incremental innovation.¹⁵⁰

From a comparative standpoint, however, Chinese enterprises at large are likely not yet as competitive in innovation as their foreign counterparts. The 2012 China Innovation Survey in Booz & Co. et al. (2011), which surveys foreign and Chinese executives in China, shows that over 50% of respondents felt Chinese companies were less innovative than their foreign competitors.¹⁵¹ Much more could be said of and many tools could be used to further analyse the innovation capacity of domestic entities in China although an exhaustive analysis herein is beyond the scope of this study.

¹⁴⁹ 2012, May 15 - Consultations with members of the European Chamber in Shanghai

¹⁵⁰ Testimony of Dan Breznitz to the US-China Economic and Security Review Commission. (2012, May 10). p. 7. Retrieved from http://www.uscc.gov/hearings/2012hearings/written_testimonies/12_5_10/breznitz.pdf

¹⁵¹ Booz and Company (2012, June 7). 2012 China Innovation Survey: Innovation- China's next advantage? *Booz & Company Inc.* p. 2. Retrieved from <http://www.booz.com/cn/home/41992563/41993453/50636275>

Trends in innovation from foreign entities in China and domestic Chinese entities

Some sources tout that China's innovative potential is relatively high. For example, a variety of news sources, including Reuters and Forbes, have run the headline that China is a global leader in innovation.¹⁵²

Also, from one perspective, China scores well on academic rankings for innovation. A 2011 report by the Chinese Academy of Science and Technology for Development (CASTED) found China to rank 21st in terms of innovative abilities amongst the world's top 40 most innovation economies.¹⁵³ The World Economic Forum's 2011 Global Competitiveness ranks China 31st out of 142 countries on the composite "Innovation and sophistication factors" indicator, therein scoring 37th on "Business sophistication" and 29th on "Innovation" whereas the latter score is led by good performance on the sub-indicator of "government procurement of advanced technological products," followed by indicators like "innovation capacity."¹⁵⁴ INSEAD et al. (2011) Global Innovation Index 2011 ranks China 29th globally in terms of its innovation capacity.¹⁵⁵

Still, from another perspective, China has a notable way to go in becoming innovative. For example, despite the aforementioned high scores on China's innovation capacity, it is striking to note that China ranks a very low 100 out of 142 countries, including some of most underdeveloped countries in the world, on the World Economic Forum's 2011 Global Competitiveness sub-indicator for "Availability of the latest technologies." And in the same report China ranks 77th on the composite "Technological readiness" indicator and 61st on the "Firm-level technology absorption" sub-indicator.¹⁵⁶ More importantly, to put all the innovation rankings mentioned in the above paragraph in better context, these studies suggest there are at least 20 highly competitive countries at present that are more innovative than China, which, from one point of view at least, is in fact a sizeable number. Additionally, some sources, for example Vaitheeswaran (2012), find that while China does well in certain types of innovation, its innovation capacity is in fact typical of developing economies seeking to catch up with innovative developed countries, and it overall fairs poorly on an important aspect of innovation: using new thinking to create market value.¹⁵⁷ Much more could be said of and many tools used to further analyse China's innovation capacity; however, an exhaustive analysis herein is beyond the scope of this study. Nonetheless, collectively, the findings mentioned thus far in this study clearly show that China indeed has a growingly impressive innovation potential, although in some sense its actual innovation at present is overhyped.

¹⁵² Among others see: Chesbrough, H. (2010, November 11). China, innovation superpower: How to deal with it. *Forbes*. Retrieved from <http://www.forbes.com/2010/11/11/china-innovation-globalization-leadership-managing-strategy.html>; China the next leader in innovation. (2010, December 7). *The News International*. Retrieved from <http://www.thenews.com.pk/article-6709-China-the-next-leader-in-innovation>; and China Poised to Become a Global Innovation Leader. (2010, October 6). *Thomas Reuters*. Press Release. Retrieved from http://thomsonreuters.com/content/press_room/legal/626670

¹⁵³ China ranks 21st on its own global innovation list. (2011, February 2). *China Daily*. http://www.chinadaily.com.cn/china/2011-02/25/content_12075099.htm

¹⁵⁴ World Economic Forum (2011). *Global competitiveness report 2011-2012*, p. 149 www3.weforum.org/docs/WEF_GCR_Report_2011-12.pdf

¹⁵⁵ INSEAD, Alcatel- Lucent, Booz and Company, Confederation of Indian Industry, & WIPO. (2011). *The global innovation index 2011: Accelerating growth and development*, p. xviii. Retrieved from http://www.globalinnovationindex.org/gii/main/previous/2010-11/FullReport_10-11.pdf

¹⁵⁶ World Economic Forum. (2011). *Global competitiveness report 2011-2012*, pp 148-149. Retrieved from www3.weforum.org/docs/WEF_GCR_Report_2011-12.pdf

¹⁵⁷ Vaitheeswaran, V. V. (2012). *Need, speed, and greed: How the new rules of innovation can transform businesses, propel nations to greatness, and tame the world's most wicked problems*. New York, NY. Harper Collins.

III.1.2 Summary

Analysis of a variety of patent statistics suggests that China's progress in patent quality lags behind rates of patent filings. There are higher ratios of domestic to foreign filings of invention patents in EU countries sampled than in China. There are significantly lower average life-spans of Chinese patents and lower percentages of patents in-force owned by domestic filers vs. foreign filers in China compared with the rates in EU countries sampled; higher rates of utility model invalidations than invention patent and design patent invalidations; concerning rates of patents filed solely for malicious prosecution actions, which may be made up more so of utility models than other types of patents; poor scores in terms of patent citations; and empirical econometric analyses generally shows foreign enterprises at large do not typically file patents on breakthrough inventions in China. In effect, the analysis confirms that China indeed has a patent quality problem as certain scholars and industry experts, as well as Chinese government officials in meetings with the European Chamber and otherwise, have suspected.

In addition, there is reason for concern when looking ahead at the possibility that China's patent ecosystem may be less composed of highest-quality patents than perhaps envisaged. For example, this study's projections indicate that, all else constant, there might be over 2.6 million less-than-highest-quality patents (utility models and design patents) filed in China in 2015 alone, which would be substantially more than the estimated filings of highest-quality patents in that year. Of note, it is projected there might be 39% more (over 430,000) total utility model applications than total invention patent applications filed in China in 2015, which is 28 percentage points more than the comparison rate between the two in 2011. The year 2015 is significant because major Chinese policies set it as the year by which their patent targets are to be realised.

In terms of its innovation capacity at large, metrics suggests that China indeed has a growingly impressive innovation potential, although in some sense its actual innovation is overhyped. For example, China does not attract EU innovation spending on a scale as perhaps otherwise suspected; and, despite some exceptions, empirical evidence suggests foreign firms at large avoid developing or transferring breakthrough technology, and filing patents on such technology, in China. There are reports of concerning distribution of government-sponsored innovation investment, which can drag down innovation; and evidence that Chinese SOEs, in which many innovation hopes are invested, typically lag on a variety of innovation metrics. Further, even the most positive rankings show there are at least 20 highly competitive countries that are more innovative than China at present, which, from one point of view at least, is in fact a sizeable number.

Given these findings, the question then becomes what unaddressed patent-related policies and practices in China hamper it from better building patent quality and innovation, and which of these might be able to be practically solved in the near-term. These issues are explored in Chapters 2-4 of this study.

III.2 Chapter 2: Government-set patent targets and indicators

III.2.1 Analysis

III.2.1.1 Sub-section 2.1: Patent-specific targets and indicators

Introduction: This sub-section explores how the system of a vast amount of patent-related goals China has set out at the national-level and more so at the provincial/municipal level likely do not best allow the authorities to meet their aims of stimulating future patent quality and innovation in China. The analysis concentrates on quantitative patent targets set out in a range of policies, as well as patent indicators in performance evaluation assessments for a range of entities.

III.2.1.1.1 Quantitative patent targets

Nationwide and provincial/municipal targets

Although also the subject of policy initiatives previously, in the last few years China has released an increasing number of policy plans to encourage patent filings. These policies are promulgated at both the national and provincial/municipal levels.

In the major recent national-level policies reviewed, China has set-forth over 10 different quantitative patent targets for the next several years. Some of these targets include:

- The *S&T MLP* sets the goal for China to be among the top five countries in the world in terms of annual invention patents granted to Chinese nationals by 2020.¹⁵⁸
- China's nationwide *12th Five Year Plan* sets the target that "invention patents owned should be increased from 1.7 to 3.3 per ten thousand people by 2015."¹⁵⁹
- The *SC Notice on IPR in Strategic Emerging Industries* sets out targets that by 2015 the number of invention patents owned and international patent applications in strategic emerging industries will be tripled compared to the figures in 2010.¹⁶⁰
- The most overarching of China's patent-specific development plans is the *NPDS*, mentioned in the Introduction section, which sets a number of ambitious goals in patent development, including for China to file 2 million annual patent applications by 2015 (other targets from the *NPDS* are outlined in the "Chapter 2" section in the Annex).

In addition to the recent national-level patent development policies, China's provinces/municipalities have collectively set over 150 region-specific quantitative patent targets for the next several years, mostly 2015, in the major recent policies reviewed in this study alone. Many provinces/municipalities have their own Provincial/Municipal *Intellectual Property (IP) Strategy*, or an equivalent, which usually also contains quantitative patent-related targets. Many provinces/municipalities throughout China also have, or instead of the aforementioned IP strategy have, their own *12th Five Year Intellectual Property Plan*, or science and technology plan, or equivalent, which usually always contains quantitative patent-related targets. Additionally, although not reviewed at length in this study, it appears some cities/localities also have somewhat similar

¹⁵⁸ See Part II, Section 2, para. 3. Note: among other targets, the *S&T MLP* also sets the target of having the number of international citations of scientific papers written by Chinese nationals to be among the top five countries in the world.

¹⁵⁹ See Chapter 1, Section 3, para. 4.

¹⁶⁰ See Part 2, Section 2

overarching policies to implement the provincial/municipal plans and strategies. (The “Chapter 2” section in the Annex provides an extensive listing of the patent-related targets from official policy documents reviewed for this study.)

In addition to these quantitative targets, Chinese authorities and other government/quasi-government institutions have set a range of less specific patent-related targets. For example, Part 6, provision 69 in the *2012 National IP Strategy*, formulated by the Chinese Academy of Sciences (CAS), states that “*IP output targets and criteria of applying results*” will be formulated for “*select major strategic pioneering projects*.” Some of the provincial/municipal plans reviewed contain non-quantitative targets, usually in addition to, although sometimes instead of, quantitative patent targets.

Minor concerns over details in certain targets

As illustrated by statistics in Chapter 1 and the “Chapter 1” section in the Annex of this study, by no means are all patents filed in China actually granted (roughly less than half are), let alone turn into commercially viable products or processes or otherwise have notable value and remain in-force over an extended period of time – thus overly basing an innovation strategy on patent applications overlooks the serious weakness of such an indicator in China to measure innovation. Many patents are filed although application or other fees are not paid, and so while the patentee actually receives a patent application number the patent is soon invalidated.¹⁶¹ In fact, many patents are abandoned somewhere in the application process, for example a significant amount of invention patents are abandoned before the Substantive Examination phase as their filers realise they are based on unviable products or processes.¹⁶² Further, patents can be denied for any number of reasons during the application process prior to registration, or can be successfully challenged as infringing and invalidated after registration. Additionally, and very importantly, patents that are successfully registered are invalidated if rights owners do not properly pay patent maintenance fees. There are also other reasons certain patents registrations do not result in valid patents – for example, utility model and invention patent applications can be filed on the same solution, one can obtain the utility model first, and then when/if awarded the invention patent can abandon the utility model for the invention patent.

Collectively, most of the IP plans and IP strategies (when hereafter referred to collectively, the reviewed IP plans, strategies, and equivalent policies and implementing measures are called “proposals”)¹⁶³ set targets not only for patent applications but also patents issued/granted; however, this is not always the case. Most of the proposals set targets for patents issued/granted and therein set specific targets for invention patents issued/granted in addition to the quantitative targets simply for patents (inferably inclusive of invention patents, utility models, and design patents). Some provinces/municipalities, like Tianjin, even set particularly solid targets therein (see Table 11, and see the “Chapter 2” section in the Annex for other solid targets set out by different provinces/municipalities). However, other proposals, for example Hebei’s, do not mention targets for granted patents, but only those for patent applications, which is problematic in so much as subsequent implementing measures are based on these targets rather than at least also on granting rates (see Table 11 for these targets).

¹⁶¹ Patent fees must be paid within two months after a patent is filed (Source: SIPO. (2008, March 19). *Instructions on patent fee payment*. Retrieved from http://www.sipo.gov.cn/zlsqzn/sqq/zlfy/200804/t20080422_390241.html)

¹⁶² Whereas Gao et al. (2011), p. 17, finds that between 2001 and 2010 the average granting rate for invention applications that underwent Substantive Examination was 64.4% (thus around 36% did not).

¹⁶³ Only if there is a weakness in a province’s/municipality’s IP plan not compensated for by its IP strategy or another measure, or vice versa, than such weakness is highlighted herein.

A few other arguable weaknesses are present in the recent provincial/municipal IP proposals. While many of the proposals appear to set indicators for “patents in-force” or an equivalent, which as explained in the Introduction and Chapter 1 is a key indicator of how and if patents are being utilised and in-turn is a proxy for the value of the patents, this is not always the case in all proposals.¹⁶⁴ While most of the plans mention improving the dispute settlement frameworks (e.g. in terms of administrative enforcement and transfer of criminal cases), and some record their progress (even quantitatively) on completed IPR disputes/infringement cases over the past 11th Five Year Plan period – most do not set any type of quantitative future indicators for reducing infringement to supplement their other quantitative targets. Nor do the plans specifically mention potential ‘double-counting’ of utility models later abandoned for invention patents in meeting their quantitative targets. These are arguably weaknesses in the plans.¹⁶⁵

Table 11: Example targets from major recent IP proposals reviewed

Province/ Municipality	Name of proposal	Patent targets
Hebei	<i>IP Plan issued in 2011</i>	<i>Targets by the year of 2015:</i> <ul style="list-style-type: none"> • Annual patent applications = 25,000 • Patent applications ≥ 12% annual growth rate • Annual invention patent applications = 8,000 • Invention patent applications ≥ 15% annual growth rate
	<i>IP Strategy issued in 2009</i>	<i>Targets by the year of 2013:</i> <ul style="list-style-type: none"> • Patent applications ≥ 15% annual growth rate • Annual patent applications ≥ 20,000
Tianjin	<i>IP Strategy issued in 2010</i>	<i>Targets for the following 3 years:</i> <ul style="list-style-type: none"> • The total number of patent applications ≥ 200,000 • The total number of valid patents ≥ 40,000, with valid invention patents accounting for 1/3 of the total number of valid patents • The proportion of valid patents to account for over 60% of total patents of enterprises • The number of enterprises owning patents to be 5,000 • The total number of foreign patent applications to be 1,000

Source: Author’s selection of patent targets from provincial IP plans and strategies. Note: a longer listing of patent targets set by provinces/municipalities can be found in the “Chapter 2” section in the Annex.

Larger concerns with the targets

Patent targets, if well crafted, in themselves do not necessarily undermine a strategy to build up patent quality. However, concern does arise depending on how stringently these targets are used and, in a related vein, to what extent they are emphasised, to guide policy meant to boost patent quality and innovation.

The most fundamental problem with what appears to be a quite heavy focus on quantitative patent-related targets in China is that it overshadows the type of benchmarking that better reflects the nuances that underlie creativity, which is the fundamental building block of quality patents, highest-quality patents in particular, and innovation at large. Unlike the export-led and investment-led

¹⁶⁴ One reason for this could be the newness of readily available data for this indicator, whereas not until 2009 did the National Bureau of Statistics create “patents in-force” as a new indicator in the Bulletin of Economic and Social Statistics, and only in 2010 was the indicator used in the China Statistical Yearbook.

¹⁶⁵ Also, it is worth noting that a number of provinces do not yet have a recently promulgated and publicly available core IP plan or strategy. Regions in the former category include Inner Mongolia, Jilin (although a city plan is publicly available for Changcun, Jilin which notably only mentions targets for patent applications and none for patents granted), and Tibet.

growth model founded on lower-end products and certain targets that has to date impressively driven China's economy, building highest-quality patents and breakthrough innovation requires a significantly different type of policy thinking. One cannot force' creativity, but rather nurture it, whereas creativity leading to breakthroughs of the type that typically produce the highest-quality patents at best come in spurts, and are most often only realised in the mid- to long-term through a range of solid inputs. The risk-taking and creative development process underlying highest-quality patents may not provide the short-term 12-month (a target time period stipulated in annual IP work plans reviewed for this study, which are meant to implement the longer term IP proposals) or even several-year patent outputs (a target time period proposed in many IP proposals reviewed in this study) needed to meet these targets. As such, overly focusing on ambitious quantitative patent targets arguably detracts efforts needed to nurture a culture that will produce highest-quality patent-worthy breakthroughs and innovation at large by valuing patent quantity too highly. This of course does not at all mean this emphasis will not effectively boost the *quantity* of patents, which it in fact may do quite effectively.

In the same vein, it is worth pointing out that absolute numbers of patents are only one indicator, and an imperfect one at that, of the actual economic relevance of certain solutions, and as such what appears to be China's overly heavy focus on patent targets instead of a more dynamic gauging of a range of innovation-relevant targets may not optimally, or at worst distortedly, foster innovation in China. Overly focusing on patent targets overshadows measurements of certain inputs and other forms of creative-environment development that are essential to developing highest-quality patents and innovations. Further, overemphasis on absolute numbers of patents does not appropriately capture the actual potential for patented inventions to be transformed into something useful and thus constitute an innovation. This is certainly not to say that China is not instituting parallel measures outside the patent-related measures to measure innovation inputs or other measures to encourage creativity, which they certainly are (for example, authorities have set R&D metrics, goals for educational spending, and so on, some of which are discussed in the performance evaluation assessments mentioned in the next section). However, in the judgment of this study, given what appears to be their centrality and emphasis in innovation policy at large, there is room to be concerned that there is an overly heavy focus on patent targets.

Further, China's approach to innovation based on what could be called a "Soviet-style"¹⁶⁶/highly state-orchestrated system of patent targets is not ideal given the still developing nature of its regulatory and institutional framework, which detracts from realising the policy objectives that underlie the targets. Introducing strict quantitative patent targets can put a type of pressure on implementing government ministries, as well as enterprises and others falling under the purview of such targets, to perform 'no matter what' to meet the targets. This pressure is particularly problematic in China, whereas given the still developing nature of its institutional and regulatory system, it is quite plausible for some entities to skirt appropriate monitoring and evaluation, IPR enforcement, and other quality control mechanisms in order to ensure they meet the aforementioned targets. As such, while the quantitative patent targets may ultimately be reached through these means, the ostensible underlying policy objectives of the targets to sustainably build innovation capacity and quality patents in China are undermined.

Additionally, the negative consequences of not meeting the underlying policy objectives is compounded by the fact that, given the overemphasis on patent targets in the first place, there are less than adequate 'back-up' methods to mitigate these consequences. Herein, a more dynamic focus on a range of relevant innovation targets would be a better 'back-up method,' and is

¹⁶⁶ Interestingly, some of the provincial/municipal IP plans and strategies reviewed for this study explicitly mention the Soviet Union in certain provisions.

contingent on the strength of other initiatives like the patent-based performance evaluation assessments mentioned below in Section III.2.1.1.2.

Another concern with China's emphasis on patent targets is that they might be tied to certain discriminatory policies and practices to meet such targets. This may discourage foreign companies from using highest-quality patents and conducting certain innovation in China. (See Chapter 3 for details herein).

It is worth noting that while some countries in the EU, for example Bulgaria, which is a developing country,¹⁶⁷ set some quantitative patent-related targets at present, neither the number, ambitiousness, nor the weight given to such targets in actually encouraging innovation appears to be anywhere near the level of that in China.¹⁶⁸ China is comparatively quite different in this regard.

III.2.1.1.2 Patent-based performance evaluations for universities and research institutes; SOEs and other enterprises; Party officials and other individuals

Details of the evaluation mechanisms

A variety of patent-based indicators have been established by the Chinese government for evaluating the performance of Chinese research institutes and universities; SOEs and other enterprises; and key Party officials and other government employees. Recent national-level measures have set forth IP components in performance evaluations. Also, a wide-range of major recent provincial/municipal IP proposals set forth a number of performance evaluation assessment mechanisms for a variety of actors. The analysis below briefly looks at some of these proposals.

It is first worth commending certain authorities for setting forth solid patent-based performance indicators that are indeed likely to encourage highest-quality patent filings in China. For example, certain major national-level initiatives have emphasised the importance of IP quality and the market value of IP in performance evaluations, e.g. Part 3, Article 2 of the *SC Notice on IPR in Strategic Emerging Industries* finds that "...We shall gradually increase the weight of intellectual property quality and market value in related assessments and evaluation..." Also, it is clear that a number of provinces/municipalities have clearly set up solid performance evaluation mechanisms to build patent quality. For example, as illustrated in the "Chapter 2" section in the Annex, a number of recent provincial/municipal IP proposals reviewed for this study have particularly strong performance evaluation assessments for boosting patent quality given their focus on invention patent development; R&D investment; industrialisation, commercialisation, and transformation of patents; high-tech enterprise development including patents; among other components (for some solid examples herein see the plans of Liaoning and Zhejiang).

To illustrate some of the different types of patent-related performance evaluation mechanisms set out in provincial/municipal IP proposals (in addition to those listed in the Annex), see Table 12 below:

¹⁶⁷ International Monetary Fund [IMF]. (2011, April). *World economic outlook report*. Retrieved from <http://www.imf.org/external/pubs/ft/weo/2011/01/pdf/text.pdf>

¹⁶⁸ Bulgaria has set an indicator for "Number of patents and industrial designs defended before the European Patent Office," measured via number of certificates issued, and targeted to move from 9 to 30 by 2020. (Source: Bulgaria's national research strategy 2020. Monitoring indicators, p. 33. Retrieved from http://www.mon.bg/opencms/export/sites/mon/en/top_menu/science/national_research_strategy-2020.pdf)

Table 12: Example IP indicators in performance evaluations in recent IP proposals

Province/Municipality	Performance-evaluation targets
Hainan	<p>Section 4, Part 3: “... Make the obtainment of indigenous IPR the most important prerequisite for the examination and acceptance of project planning for important science and technology project planning and innovation platforms. Gradually establish an IPR examination and development system for Hainan’s important science and technology innovation projects. Incorporate indigenous IPR output quantity, quality, implementation benefits, and IPR system construction conditions into the project evaluation index system and conduct supervision and management of the system.”</p> <p>Section 4, Part 5: “Further improve the assessment of patent work; consider patent work performance as one of the necessary conditions for performance evaluation of corporate technology centres, high-tech enterprises and hi-tech industrial parks. Incorporate the management performance of patent work, including the amount of R&D investment, the quantity and quality of patents, patent transformation, patent transfer and patent licensing, into the annual performance management assessment indicators for the relevant administrative departments, encouraging innovation.”</p>
Jiangsu	<p>Section 4, Part 2, Para 1: “Strengthening catalogued evaluation on invention performance of universities and institutes, and obtaining original patents should be the key elements of evaluation of basic research and cutting-edge technology research, obtaining invention patents and utility models should be the key elements of evaluation on applied research, developed research...improving the patents grant and rewards system, enacting ‘Measures on Patent Rewards in Jiangsu Province’ to stimulate inventing and improve patent quality.”</p>
Tianjin	<p>Section 5, Article 3: “Incorporating the work performance of intellectual property into the performance evaluation index system of Party and government leading cadres and the persons in charge of SOEs.”</p>

Source: Author’s selection of articles from according provincial/municipal 12th Five Year IP Plans (promulgated in 2011). Translations are from the European Chamber thus are unofficial.

While, as mentioned, several of the IP proposals reviewed clearly set forth solid performance evaluation mechanisms to build patent quality, it is still at least worth seeking assurances from the many different relevant authorities across provinces/municipalities in China about the impact of their performance evaluation systems. Specifically, it is worth discussing if and how their performance evaluation mechanisms will best discourage development and subsequent filing of low-quality patents and encourage patents of relatively higher quality that are most appropriate for their particular region at their current stage of development. There are worst case scenarios that deserve attention. Some of the patent evaluation criteria reviewed, at least if unmodified by other measures that would otherwise strongly boost patent quality, may overly encourage the filing of utility models on solutions of the lowest inventiveness as an ‘easy’ way to meet the indicators. If not crafted and implemented properly, some patent performance indicators may actually raise the opportunity cost for developing and filing highest-quality patents, making it even less costly to just develop and file low-quality patents. Also, if these indicators, for example those on “indigenous IPR” are linked to overly burdensome and/or unreasonable preconditions for participating in innovation building, for example as mentioned in the section in Chapter 3 on “INP IP,” they can discourage development of quality patents.

As a note, it appears that the IP proposals reviewed in this study contain limited if any repercussions, even generally, for poor performance or proliferation of low-quality IPR, patents included. This would seem to be an important disincentive to try and ‘sneak through’ performance reviews with low-quality patents, or at least those with less than desired thresholds of quality. While it seems likely that these repercussions could already be included in forthcoming implementing measures of the IP proposals reviewed, if not they should be included.

SASAC-specific performance evaluations for SOEs

As noted in Chapter 1, while on one hand it could be argued that Chinese SOEs in recent years at least do not file insignificant amounts of patents, they could certainly be filing more patents, particularly more invention patents instead of design patents and utility models. Chinese SOEs arguably should be producing better figures herein given the level of financial and other support they enjoy from the government in an attempt to make them innovative and competitive.

As illustrated in the “Chapter 2” section in the Annex, the government has set patent indicators for SOEs, which are overseen by SASAC. While this is not the first time SOEs have been encouraged to file patents, as for example the Central Committee’s 1999 decision on SOE reform also encouraged SOEs to “develop products with their own indigenously owned IPRs,”¹⁶⁹ today’s SOEs must meet what appears to be binding performance evaluation indicators for numbers of patents, including patent filings.

It is worth pointing out that SASAC’s patent development guidance links patent performance to concrete developments in specific sectors. For example, several catalogues recently promulgated by SASAC and other ministries require development and commercialisation of products in innovative or otherwise high-end industries like clean and energy efficient power generating facilities and high-precision metallurgical equipment (in addition to lower end industries).¹⁷⁰ As listed in the “Chapter 2” section of the Annex, measure 13 of the *2012 National IP Strategy* advocates for improvement in SOEs’ IPR risk precaution alerts which, while not fully clear from the language, may be exclusively related to strategic industries.¹⁷¹

What types of patents does the system foster?

It may be difficult for all SOEs to meet the patent indicators imposed upon them given that, despite some exceptions, Chinese SOEs at large have historically not been structured to focus on building quality patented innovations, particularly breakthrough patented innovations. According to Chan and Daim (2011), Girma and Gong (2008a), and Girma and Gong (2008b), given top executives in Chinese SOEs are appointed by the government and their performance is based on building their political careers, SOEs’ operations in effect tend to focus on short-term performance rather than risky longer-term investments in R&D and innovative building.¹⁷² Further, Guan et al. (2006) and

¹⁶⁹ Fourth Plenary Session of the Fifteenth Central Committee of Communist Party of China. (1999, September 22). *Decision of the Central Committee of the Communist Party of China on Major Issues Concerning the Reform and Development of State-owned Enterprises*. Retrieved from <http://cpc.people.com.cn/GB/64162/71380/71382/71386/4837883.html>.

¹⁷⁰ For example, see the *Catalogue Guiding Indigenous Innovation in Major Technology Equipment* for MoST, MoF, MIIT, and SASAC, December 2009; and MIIT, MoST, MoF, & SASAC. (2012, February 22). *Indigenous Innovation Guidance Catalogue of Large Technical Equipment*. Retrieved from <http://www.miit.gov.cn/n11293472/n11293832/n12843926/n13917042/14471328.html>

¹⁷¹ Part 2, measure 13: “Support central state-owned enterprises to search IP information and analyse patent information in certain fields around the burgeoning strategic industries, establish a mechanism for IPR infringement alert and risk precaution within the central state-owned enterprises step by step. (SASAC, SIPO)”. Note: Part 6, measure 67 of the measures state: “Promote central state-owned enterprises to fully implement IP strategy, improve the system for IP management in enterprises. (SASAC, SIPO)”

¹⁷² Chan and Daim (2011); Girma and Gong (2008a); and Girma, Sourafel, Gong, Yundan (2008b)

OECD (2007) find that overall, despite some exceptions, Chinese SOEs are not particularly efficient in knowledge production. As illustrated in Chapter 1, using 2009 as a proxy year (given lack of readily available data for other years), 65% of patent applications from medium and large-sized Chinese SOEs are for utility model and design patents, whereas only 35% are invention patent applications.

The aforementioned lack of innovation capacity is likely exacerbated by the lacking capacity of patent professionals in SOEs. Specifically, sources suggest there is a lack of patent agents, patent engineers and other patent-related professionals in SOEs.¹⁷³

Given this context, it is worth further investigation with the authorities if the patent indicator-based SOE evaluation criteria and related mechanisms may encourage SOEs to develop solutions and file patents of less-than-desired quality in an attempt to meet the indicators. This is important to ensure the criteria and evaluation mechanisms deter SOEs from such behaviour.

In the same vein, it is also worth discussing if and how SASAC's performance evaluation mechanisms are linked to certain other policies, and the impact of this linkage on patent quality. For example, it is worth seeking assurances from SASAC that the performance evaluation system does not in any way encourage the government to grant preferential access to prioritised examination of patents for SOEs (see Chapter 4 on green channel applications) that would mean foregoing appropriate review of the patents, and result in granting of some low-quality patents that would not be granted in the absence of such a mechanism. It is also worth investigating the exact initiatives to build "*indigenous IPR*" as mentioned in performance evaluation criteria (see the "INDP IP" discussion in Chapter 3 for further information on this issue.)

MoST's and government-funded S&T organisations' performance evaluations

Without more readily available information, the exact impact on patent quality of program evaluation methods of the Ministry of Science and Technology (MoST) and other government S&T-promotion entities is not fully clear; however, there may be reason for concern, and thus clarity on these issues should be sought from the authorities. Sources suggest MoST has established patent-based key performance indicators (KPIs),¹⁷⁴ which by themselves are not necessarily concerning but might be depending on how they are linked to S&T funding and tax policies jointly promulgated by MoST and other agencies. It is worth exploring if and how performance evaluations instituted by the National Natural Science Foundation of China (NSFC) and other official S&T-promotion agencies in China are structured, and if they most efficiently and effectively utilise resources to spur quality patents, and specifically highest-quality patents, and innovation at large.

SIPO-specific performance evaluations

It is widely known that SIPO has internal performance indicators linked with how many patents its workforce approves, and the good work of SIPO in fine-tuning its internal processes to stimulate better quality patents deserves to be well recognised. SIPO's performance indicators are inferably organised towards meeting the *NPDS* and other patent-related policy indicators mentioned previously. Herein, patent reviewers are under significant pressure to meet certain performance indicators. Sources suggest SIPO is taking work performance seriously, whereas a 60 person task force comprising many of SIPO's most experienced examiners has been set-up to monitor the quality of work of individual examiners, teams, and full departments via random checks. Poor performance is met with a potential salary reduction for individuals and even the group he/she works in, creating

¹⁷³ Gao et al. (2011), p. 74

¹⁷⁴ Yeo, V. (2011, September 30). Public policy aids tech innovation but not silver bullet. *ZDNet News*. Retrieved from <http://www.zdnetasia.com/public-policy-aids-tech-innovation-but-not-silver-bullet-62302301.htm>

an important incentive to do quality work. Apparently, examiners are not awarded every time they approve a patent.¹⁷⁵ Meetings with SIPO indicate that they employ 6,000 people, and realise the need to double the amount of staff over the next three years to keep up with the increase in patent applications.¹⁷⁶ These are highly commendable management initiatives.

Further discussions could be held on certain details of SIPO's management structure. Additional details could be sought from SIPO on the exact workings of their performance criteria for 'first-line' and PRB examiners. It would be helpful to be privy to a presentation on how the indicators are most effectively discouraging examiners from approving low-quality patents that should be invalidated, and best rewarding those reviewers that work efficiently and effectively in approving deserving patents.¹⁷⁷

Performance evaluations for intermediary services

It is worth discussing with the authorities the effectiveness of specific efforts to improve the performance of patent intermediary services in China, i.e. patent agencies and their patent application writers, and patent application writers not affiliated with patent agencies (all such individuals are external to SIPO). This is important given the well-known problems with patent intermediary services in China, including the poor writing of patent application documents and poor translations from foreign languages to Chinese therein, as well as general issues concerning the experience and technical level of the patent writers.¹⁷⁸

III.2.1.2 Sub-section 2.2: Other targets

Introduction: This sub-section briefly explores how other policy targets may, in combination with the patent targets and indicators mentioned in the prior sub-section, negatively impact China's ability to stimulate patent quality and innovation.

III.2.1.2.1 GDP targets

GDP targets imposed by provincial/municipal level governments may in some ways discourage risk-taking needed to boost breakthrough inventions and innovation in a way that other types of measures might. This is due to the same concerns mentioned in sub-section 2.1 surrounding quantitative patent targets. While provincial/municipal GDP growth indicators for 2012 have been reduced in every province/municipality except Hainan,¹⁷⁹ when compounded by the concerns mentioned with the patent targets imposed at the national-level and by sub-central level governments, they may collectively somewhat hamper initiatives that could better stimulate sustainable development of innovation and associated quality patents.

¹⁷⁵ Wild, J. (2011, January). Quality is China's biggest patent challenge. *Intellectual Assessment Management*. Retrieved from <http://www.iam-magazine.com/blog/Detail.aspx?g=e81c5421-bccc-4eb5-9895-f347443cf73e>

¹⁷⁶ 2011, October 28- Meeting with SIPO officials and European Chamber representatives at SIPO in Beijing

¹⁷⁷ It would also be useful to have an update on SIPO's efforts to ensure their reviewers are not only technically trained, but also trained as necessary in law.

¹⁷⁸ Also of concern is the technical writing capacity of applicants that work with the intermediary services. Note: In 2010, there were 779 patent agencies in China and 12,000 qualified patent agents, although only half of these agents worked for agencies (Source: Gao et al. (2011), p. 76)

¹⁷⁹ Thirty provinces lower GDP growth target. (2012, February 23). *China Daily*. Retrieved from http://www.chinadaily.com.cn/business/2012-02/23/content_14679318.htm; also see: China's inland provinces propose double-digit GDP targets. (2012, February 7). *Want China Times*. Retrieved from <http://www.wantchinatimes.com/news-subclass-cnt.aspx?id=20120207000091&cid=1102>

III.2.2 Summary

China has emphasised a range of quantitative patent targets, which while impressive in some respects, may not encourage quality let alone highest-quality patents and innovation at large as efficiently and effectively as envisaged by policymakers; in fact, they may actually discourage highest-quality patents and at worst may sometimes actually encourage development and filing of low-quality patents. There are some weaknesses in the targets due to the absence of important criteria for ensuring patent quality. Moreover, the overly heavy focus on quantitative patent targets in China overshadows the type of benchmarking that better reflects the nuances underlying creativity and the actual economic relevance of inventions, which are building blocks of quality patents and an innovation economy. Given these risks, it is important to re-think China's heavy quantitative patent target-based approach, and also essential that related performance evaluation systems for SOEs and other enterprises, Party officials, universities and research institutes, and other entities be properly crafted.

III.2.3 Recommendations

III.2.3.1 Core recommendations

III.2.3.1.1 Subsection 2.1

- 1. Consider alternative strategies and metrics for measuring the strength of Chinese innovativeness, and base policy more so on these approaches than quantitative patent targets.**

1.1 Consider making new policy targets less based on quantitative patent targets and more based on other metrics. These metrics might include sales and new product announcements, among other indicators like the RIS-style composite index mentioned below.

The Chinese authorities could consider compiling a composite innovation indicator for different provinces/municipalities in China similar to the EC's Regional Innovation Scoreboard (RIS), which could be used to monitor performance and inform policymaking.¹⁸⁰ An exchange could be organised between the Directorate General of Enterprise and Industry of the EC in charge of overseeing compilation of the EIS, and relevant Chinese entities, include SIPO, the National Bureau of Statistics, and MoST, on establishing a similar type of metric.

- 2. Recommendation: Relevant authorities should review SASAC's performance review of SOEs to ensure that any patent-based performance review process best stimulates quality patents. Issues/possible reforms herein include:**

2.1 If it is insisted that patent targets be maintained, provide higher points in the performance review to successfully granted and not subsequently invalidated invention patents or perhaps even require these invention patents to meet a superlative threshold for inventiveness. For example, a SOE would be awarded X points after being granted a patent, and additional Y points after the statute of limitations expires for challenging the patent if no successful challenges have been brought. The aforementioned level of inventiveness and patent quality at large would be determined by technical specialists and patent experts within SIPO, who would coordinate with SASAC. (Note: Due to inevitable time lags, this performance

¹⁸⁰ RIS indicators include (data sources in parenthesis): (1) Population with tertiary education (ISCED 5-6) per population aged 25-26 (Eurostat); (2) Participation in life-long learning per population aged 25-64 (Eurostat); (3) Public R&D expenditures (R&D expenditures in the government sector (GOVERD) and the higher education sector (HERD) as a percentage of GDP (Eurostat); (4) Share of households with broadband access (Eurostat); (5) Business R&D expenditures (BERD) as a percentage of GDP (Eurostat); (6) Non-R&D innovation expenditures of SMEs as a percentage of turnover (Eurostat); (7) SMEs innovating in-house as a percentage of all SMEs (Eurostat CIS); (8) Innovative SMEs collaborating with others as a percentage of all SMEs (Eurostat CIS); (9) Number of patents applied for at the EPO per million population (Eurostat); (10) SMEs introducing product or process innovations as a percentage of all SMEs (Eurostat CIS); (11) Number of SMEs that are innovating who replied in surveys that their product or process innovation had a highly important effect on reducing labour costs per unit of output as a percentage of all SMEs (Eurostat CIS); (12) Number of SMEs that are innovating who replied that their product or process innovation had a highly important effect on reducing materials and energy per unit of output as a percentage of all SMEs (survey); (13) employment in medium-high & high-tech manufacturing (% workforce) (Eurostat); (14) Employment in knowledge-intensive services (% of workforce) (Eurostat); (15) new-to-market sales of all SMEs as a percentage of turnover (Eurostat CIS); and (16) new-to-firm sales of all SMEs as a percentage of turnover (Eurostat CIS). (Source: Hollanders, H., Tarantola, S., & Loschky, A. (2009). *Regional innovation scoreboard (RIS) 2009*. Inno Metrics.)

evaluation methodology may result in negative performance statistics being registered in a different year [e.g. 2014] or quarter than the negative performance [e.g. the invalidation of a patent] was actually executed [e.g. 2013], thus potentially less than optimally rewarding positive performance in the latter year. Likewise, it may reward positive performance in a different year or quarter than the positive performance [e.g. time the patent was granted would be after the time its underlying solution was developed]. Nonetheless, this approach arguably provides necessary incentives to make sure SOEs are careful in their filings, and creates incentives to file legitimate invention patents.)

2.2 Ensure that SOEs with patents that are successfully challenged as infringing do not count such patents as positive statistics in their performance review. Successfully challenged patents should count as a negative statistic in an SOE's performance review.

2.3 Ensure that when utility model patents are abandoned for a simultaneously filed and later granted invention patent, that only one patent filing is counted (the invention patent) in the performance review. To be sure, any indicator of the awarding of the prior utility model should not be counted in performance indicators or at least be noted as later being abandoned for an invention patent.

2.4 Consider using a performance indicator of the ratio of an SOE's invention patents in-force to their filings of utility and design patents.

3. Recommendation: In addition to adopting a structure similar to that for SASAC's performance review for SOEs as mentioned in Recommendation 2, ensure an appropriate patent-based performance review process for all entities evaluated by the government.

3.1 MoST can give research institutes demerits that will have an effect on their funding if they poorly perform on patent-quality based indicators.

3.2 Seek more details from SIPO about how exactly its performance evaluation system best stimulates quality patents and discourages low-quality patents.

3.3 Review other entities performance review systems and ensure all patent-based criteria therein are effectively centered on quality metrics.

4. Recommendation: Establish a forum involving government, academics, and competitive domestic companies for best-practice sharing on how to best craft patent strategies for SOEs and other government-funded entities. This should include a discussion on what should be patented vs. protected as a trade secret, when a solution should be abandoned rather than continuing with the patent application process, among other related considerations.

5. Recommendation: the central-level, led by the State Council, should set-up an incentive system and monitoring mechanism whereby departments that implement the best systems for encouraging patent quality are given certain recognitions/awards. It should be noted that at the same time performance indicators would need to be changed for ministries whose performance is overly tied to absolute numbers of patents.

6. Recommendation: Establish a formal program and forum aimed at discussing and deciding on better tools to screen and monitor patent quality. Chinese ministries, in partnership with think-tanks and industry experts should adopt new methodologies to monitor patent quality and

adjust policies accordingly. For example, if upon scrutiny of the methodology of the IPDRC's patent strength ranking (which does not appear to be possible due to lack of publically available information on the methodology at the time of publication of this study), it is determined the ranking is solid, than incorporate it as part of this program.

III.2.3.2 Other recommendations

III.2.3.2.1 Sub-section 2.2

- 7. Recommendation: Reassess economic indicators imposed by provincial/municipal governments that may not most efficiently and effectively spur innovation in the near-term, and replace them as necessary with new indicators.**

III.3 Chapter 3: Other policies meant to promote patents

III.3.1 Analysis

III.3.1.1 Sub-section 3.1: Patent-specific measures

Introduction: This sub-section investigates how a myriad of significant Chinese measures (hereafter “policies” and “measures” are used interchangeably) specifically mentioning IP (patents inclusive), most of which are also at least partially meant to stimulate patents, can sometimes discourage quality patents and innovation. As illustrated in the Introduction section, the Chinese government has promulgated a wide variety of patent-specific policies that likely effectively build patent quality in China; yet, there are also concerning components of a variety of other measures that likely do not result in similar outcomes. These measures are the subject of this section.

III.3.1.1.1 Financial and other incentives for patent development and/or with patent-related requirements

III.3.1.1.1.1 Subsidies specifically for patent filing

For some time now, regional governments have been tasked with providing subsidies for entities filing IPR, the most common of which are subsidies for patent applications that cover official processing fees and even attorney fees. These subsidies have been extended to all types of patents: design, utility model, and invention patents. Many subsidies focus on domestic filings. Some subsidies focus on certain types of patent filings abroad, for example via the PCT.¹⁸¹

The main problem with current patent filing subsidies is that they are largely awarded in a manner that not only wastes resources, but otherwise does not necessarily most effectively support the building of highest-quality patents and related innovation. Gao et al. (2011) notes that this deficiency is manifested in repeated patent applications, splitting inventions into smaller inventions just to boost the number of applications, filings for products that are already published or disclosed for a significant amount of time and are not patentable, filing an application to get an application number but not paying fees, and so on.¹⁸² This is an unnecessary waste of resources. In the same vein, it does not result in channelling resources effectively and efficiently to build the highest-quality patents and related innovation that China desires.

While the government is commendably already taking steps to reform the patent subsidy system, it appears that notably more needs to be done. Policy statements like the *NPDS*¹⁸³ and *2012 National*

¹⁸¹ See the *Administrative Measures on Special Funds for Subsidising Foreign Patent Applications* issued by MoF on April 14th 2012. Among others, see the *Provisional Measures on the Administration of Special Patent Funds for Subsidising Filing Patents Abroad*, issued by MoF on September 15th 2009. Related provincial/municipal-level regulations, for example those focusing on invention patents include, among others, the *2012 Jinan Standards on Financial Support for Patents*, effective March 6th 2012.

¹⁸² Gao et al. (2011), pp 86-89

¹⁸³ For example, see Part IV, Section 4, para. 1 of the *NPDS* which calls policymakers to “*Optimise patent subsidy policy and further define the orientation to enhance patent quality...*”

*IP Strategy*¹⁸⁴ have made the need for reforming the patent subsidy system apparent. Many Chinese government bodies reportedly now only pay subsidies when the patent is granted as opposed to at the application stage.¹⁸⁵ Some provinces/municipalities, for example, Shanghai, are reforming their systems to only grant subsidies for invention patents.¹⁸⁶ Nonetheless, it appears that a number of specific initiatives could be undertaken to more fully improve the subsidy system that do not appear to be currently discussed, at least publically. As such, these initiatives deserve to be considered by the authorities (see Recommendation 8 for further details).

III.3.1.1.1.2 IP ownership and restricted licensing provisions in currently effective indigenous innovation policies: an overview

Background

The concept of “indigenous innovation,” also sometimes translated as “independent innovation,” (whereas the Chinese equivalent of both terms is *zìzhǔ chuàngxīn*/自主创新), form the basis of what has become known as China’s “indigenous innovation policy” (IIP). Many observers now generally consider China’s IIP to also be the name for its innovation strategy at large. The *S&T MLP*, which has often been pointed to as establishing the main framework for the concept, defines “indigenous innovation” as “*enhancing original innovation, integrated innovation, and re-innovation based on assimilation and absorption of imported technology, in order to improve our national innovation capability.*”¹⁸⁷ The plan further states that “...one should be clearly aware that importation of technology without emphasising assimilation, absorption, and re-innovation is bound to weaken the nation’s indigenous R&D capability, which in-turn widens the gap with world advanced levels.”¹⁸⁸

It is worth noting that although the *S&T MLP* does not explicitly emphasise “breakthrough” innovation by name, it is nonetheless clear from some subsequent policy statements that breakthrough innovation, and indigenous breakthrough innovation specifically, is one goal of China’s innovation strategy. For example, this goal is in part reflected in China’s recent focus on cutting-edge strategic industries, for example in China’s 12th *Five-Year Plan* and the *SC Notice on IPR in Strategic Emerging Industries*, and in other initiatives in other measures cited throughout this study.

Several central and local-level implementing regulations from MoST, the National Development and Reform Commission (NDRC), Ministry of Finance (MoF) and their sub-central-level equivalents soon followed issuance of the *S&T MLP*, creating enacting IIP product catalogues, financing programs, and other IIP initiatives. The *Trial Measures for the Administration of the Accreditation of National Indigenous Innovation Products* (“2006 IIP Trial Measures”), issued on December 31st 2006 by MoST, NDRC, and MoF contain highly controversial requirements herein: specifically, requirements in Article 4.2 that products must be produced by a company with full ownership of the IPR on relevant products via its own activities or (by legal means) otherwise obtained ownership or usage rights for IP that is legally owned in China by a Chinese company, organisation, or citizen (and Article 4.3 that trademarks have to be owned by a Chinese company and originally registered in China, Article 4.4 and 4.6 that contain certain requirements on certifications and quality of qualifying products, and

¹⁸⁴ See Part 1, measure 5: “*Improve the monitoring and settlement of abnormal patent applications, regulate local patent subsidy, promulgate in due time further opinions on regulating patent subsidy. (SIPO)*”

¹⁸⁵ The patent quality challenge facing China and its businesses. (2011, January 20). *IAM Magazine*. <http://www.iam-magazine.com/issues/article.ashx?g=64724577-cf28-4cb1-bad6-c012264ee060>

¹⁸⁶ 2012, April 24- Consultations with Lin Xu, Vice Chair of IPR Working Group

¹⁸⁷ Part II, Section 1, para. 2 *S&T MLP*. Retrieved (in Chinese) from http://www.gov.cn/jrzq/2006-02/09/content_183787.htm (one English translation available here:

<http://www.etiea.cn/data/attachment/123%286%29.pdf>)

¹⁸⁸ Part II, Section 1, para. 3, *S&T MLP*

Article 4.7 that contains import substitution requirements).¹⁸⁹ These provisions again appeared in the *Measures on the Interpretation of National Indigenous Innovation Products*, issued by MoST on February 26th 2007.¹⁹⁰ Several measures in 2006 and 2007, including provincial/municipal implementing measures, created controversy by linking indigenous innovation to government procurement preferences.¹⁹¹ And once implementing measures for central-level government procurement product catalogues were issued in late 2009 and January 2010,¹⁹² foreign businesses actively banded together to complain against such IIPs.

Recent reforms

Commendably, the Chinese government has recently made firm policy statements that prior IIP policies will be delinked from government procurement preferences. As of July 1st 2011, the Chinese authorities agreed to nullify and void three regulations linking controversial IP requirements to preferential government procurement,¹⁹³ and a formal notice was issued on July 4th 2011 nullifying the *2006 IIP Trial Measures*.¹⁹⁴ And on November 17th 2011, the State Council issued a notice stating: “Any mention of linkage between innovation policy and government procurement incentive measures within regulatory documents from all levels of local people’s governments and related departments must without exception stop implementation from December 1st 2011.”¹⁹⁵ While there are still some concerns over the actual implementation of these aforementioned measures, they are at least clear and indisputably positive in their own right.

¹⁸⁹ Concerns as raised in, among other sources, US-China Business Council [USCBC]. (2011, March). *Issues brief: China’s domestic innovation and government procurement policies*, pp 3-5. Retrieved from https://www.uschina.org/public/documents/2011/innovation_procurement_brief.pdf; Review of according articles in the *Trial Measures for the Administration of the Accreditation of National Indigenous Innovation Products* retrieved from <http://big5.mofcom.gov.cn/gate/big5/im.mofcom.gov.cn/aarticle/subject/zsjm/localcc/201012/20101207305384.html>. Note 1: depending on the secondary source reviewed, some or all of these issues may be listed as concerns, for example, USCBC (March 2011), Appendix 6, provides a detailed list of indigenous innovation requirements that explicitly require import substitution as part of indigenous innovation development.

¹⁹⁰ Para. 5 of the *Measures on the Interpretation of National Independent Innovation Products* retrieved from http://www.most.gov.cn/ztl/cxqygzhy/cxqyhydt/200702/t20070226_41506.htm

¹⁹¹ See Article 23 of the *S&T MLP*; Article 13, 14 and 24 of the 2007 *Evaluation Measures on Indigenous Innovation Products for Government Procurement*; among other measures listed on p. 8-9 and Appendix 6 of USCBC (March 2011). Note: Many of the sub-central level indigenous innovation accreditation/management measures listed in Appendix 6 of USCBC (March 2011) require IPR ownership requirements as distinct from licensing, or require exclusive licensing of IPR fully owned by a China-based entity.

¹⁹² In November 2009, MoST, NDRC, and MOF released two circulars, one on application procedures and a notice describing provincial duties for the proposed central-level indigenous innovation catalogue. On December 29th 2009, a catalogue of industrial equipment products was released containing stipulations for accrediting national indigenous innovation products. On January 11th 2010, the *Regulations of Government Procurement Law* nationally set-forth preferential government procurement for indigenous innovation products. A variety of other controversial IIP rules were passed at the same time that did not only focus on government procurement preferences, for example, see *Accreditation Rules for National Indigenous Innovation Products*, November 2009, among other regulations as detailed in USCBC (March 2011), p. 19.

¹⁹³ Lubman, S. (2011, July 22). Changes to China’s ‘indigenous innovation’ policy: Don’t get too excited. *Wall Street Journal*. China Realtime Report. Retrieved from <http://blogs.wsj.com/chinarealtime/2011/07/22/changes-to-chinas-indigenous-innovation-policy-dont-get-too-excited/>

¹⁹⁴ *Notice on Voiding “Trial Measures for the Administration of the Accreditation of National Indigenous Products (2006)”* issued on July 4th 2011 by MOST, NDRC and MOF. Retrieved from <http://www.jskw.gov.cn/FileUpload/%E5%85%B3%E4%BA%8E%E5%81%9C%E6%AD%A2%E6%89%A7%E8%A1%8C%E3%80%8A%E5%9B%BD%E5%AE%B6%E8%87%AA%E4%B8%BB%E5%88%9B%E6%96%B0%E4%BA%A7%E5%93%81%E8%AE%A4%E5%AE%9A%E7%AE%A1%E7%90%86%E5%8A%9E%E6%B3%95%EF%BC%88%E8%AF%95%E8%A1%8C%EF%BC%89%E3%80%8B%E7%9A%84%E9%80%9A%E7%9F%A5.pdf>

¹⁹⁵ *A State Council Notice Directing All Government Entities To Remove Any Mention of Linkages Between Indigenous Innovation Policy and Government Procurement Within Regulatory Documents*, which the Chongqing Legislative Affairs Office published on their own website: http://www.cqfzb.gov.cn/Pro_General/ContentShow.aspx?ProID=49&myid=8655

It is important to note that before the aforementioned delinking took place, a number of other policy statements changed the IIP framework, most notably the April 2010 *Draft Notice Regarding the Launch of the National Indigenous Innovation Product Accreditation Work for 2010* (hereafter the “April 2010 Draft Notice”). Article 2.2 of the *April 2010 Draft Notice* relaxed the provision on IPR ownership to allow indigenous innovation accreditation on IP licensed for use in China without specifying where the entity that owns the original IP (and is doing the licensing) must be located; Article 2.3 stipulated that trademarks no longer have to be originally registered in China (but must at least have the right to use the trademark in China); and Article 2.4 set new technology quality requirements (e.g. to be proven effective in conserving energy, or “substantially” improve on an original product’s quality, performance, structure, material, or craftsmanship to be eligible for such accreditation).¹⁹⁶

These policies were ostensibly changed due to pressure from foreign governments and industry associations.¹⁹⁷ These organisations, including the European Chamber, argued on behalf of companies saying they would prefer to license technology, particularly their most important and innovative/higher-end technologies, instead of transferring it via full-on ownership transfer agreements (or even exclusive licensing), and in many cases this technology would need to be licensed from abroad (as it is owned by parent companies registered abroad). Thus it was argued the previous IIP policies would push companies to intentionally pursue less-IP-intensive operations in China.

Existing concerns

Despite some positive changes, significant concerns surround the *April 2010 Draft Notice* in particular. Most importantly, outside a number of concerns over specific provisions in the notice,¹⁹⁸ it does not appear a final version of the *April 2010 Draft Notice* was ever even finalised, despite a call for comments deadline on the measure, and thus the measure remains unbinding.¹⁹⁹ And no other measures appear to have subsequently taken the notice’s place in making allowances for IP licensing from abroad as a core part of China’s IIP system. As such, it appears China’s IIP framework is not legally bound to only instituting the type of IP requirements that were present in the *April 2010 Draft Notice*. In fact, the type of controversial IP requirements the *April 2010 Draft Notice* was supposed to amend appear to be presently embodied in the term “indigenous intellectual property rights,” which is defined in Box 5 below.

¹⁹⁶ Other criteria also apply. See the *April 2010 Draft Notice*, issued on April 9th 2010 for public comments (till May 10th 2010), by MoST, NDRC and MoF, retrieved from http://www.most.gov.cn/tztg/201004/t20100409_76710.htm

¹⁹⁷ Ernst (2011) (p. 4 suggests that lobbying by foreign business associations “possibly” created these changes)

¹⁹⁸ Linton et al. (2010) notes that some have worriedly interpreted this measure to mean that indigenous innovation products must be locally researched and developed (including requiring licensing of IP usage rights in China), and the R&D should be led by a Chinese entity. This could exclude wholly foreign-owned enterprises (WFOEs), JVs where the foreign party has a majority holding, and perhaps Chinese entities with R&D centres abroad. Also there is concern over the requirement to comply with unspecified “national industrial and technology policies” (Article 2.1); as well as concern about the requirement that the IPR involved cannot be subject to dispute (Article 2.2.), whereas without further clarity this may include unsubstantiated allegations raised by a third party (Source: Linton, K. et al. (2010). *China: Intellectual property infringement, indigenous innovation policies, and frameworks for measuring the effects on the U.S. economy*. US International Trade Commission [USITC]. Investigation No. 332-514. p. 5-11. Retrieved from <http://www.usitc.gov/publications/332/pub4199.pdf>)

¹⁹⁹ USTR (2011) confirms that the draft measure has not been finalised to date, although notes that the Chinese authorities “have not requested or accepted applications for accreditation.” (Source: USTR. (2011). *2011 National trade estimate report on foreign trade barriers: China*. United States Trade Representative. p. 88. Retrieved from http://www.ustr.gov/webfm_send/2694)

Box 5: Note on usage of the term “indigenous intellectual property rights”

The term “*indigenous intellectual property rights*,” which one might also translate as “independent intellectual property rights” (whereas the Chinese equivalent for both is: zìzhǔ zhīshì chǎnquán/自主知识产权) is frequently found in a number of measures reviewed in this study. Consultations suggest that the term originated in the mid-1990s in policy advice to build domestic IPR in the Chinese automobile industry.²⁰⁰ At the turn of the new millennium, the term was used in important policy guidance, which is still in effect, from state leader Jiang Zemin at an April 2nd 2000 conference on the Exhibition on China's Fifteen-Year Achievements in Patent Work.²⁰¹

There is solid evidence (see below) that the term typically means IP ownership, including acquired ownership, by a Chinese entity, which in some cases expressly is said to exclude entities with a majority foreign ownership. While not the norm, the term is defined somewhat differently in the HNTA tax scheme (see below section for details); and in some cases, includes an option for restricted licensing of IP fully owned by a Chinese entity.²⁰² These concepts of “indigenous intellectual property rights” are collectively hereafter referred to in this study as “IND IP” conditions.

Some key sources defining “indigenous intellectual property rights”

Official government measures and policy advice

- The below listed measures are just a few examples of clear government policy advice that indigenous intellectual property rights mean IPR owned by a Chinese entity:
- *Guidance for Enlarging Exports with Indigenous Intellectual Property Rights* issued on May 11th 2004 by the Anhui MOFCOM sets forth guidance, which appears to still be in effect, on indigenous intellectual property rights:
 - Part 2: “*The definition of indigenous intellectual property rights is invented in China; there is no corresponding concept in the international arena. Administrations such as Ministry of Science and Technology and the IPR Bureau have not provided clear definitions of indigenous intellectual property rights. In this document, indigenous intellectual property rights refer to IPR legally owned, invented or designed by Chinese citizens; or Chinese legal persons or other organisations without legal personality (referring to those entities whose original capital formation is not majority foreign held). It also includes those IPR bought from other Chinese citizens, legal persons, or other organisations without legal personality.*”²⁰³
- *Notice on What is a Product With Independent Intellectual Property Rights?*, issued on July 3rd 2007 by the Tianjin Intellectual Property Office, which appears to still be in effect, defines indigenous intellectual property rights as:
 - “*...In China, the term ‘Indigenous Intellectual Property Rights’ refers to independent technical knowledge assets lawfully owned by Chinese citizens, legal persons, or organisations without legal personality, or leading research or creative design conducted by those entities, or the patents or copyrights purchased from other Chinese citizens, legal persons or other organisations without legal personality.*”

²⁰⁰ 2012, August 2 - Consultations with a member of the European Chamber in Shanghai

²⁰¹ “We must energetically promote the long-term development of our economy by supporting the nation's patent undertaking, enhancing the role of the patent system and furthering growth of high-tech products with self-owned independent intellectual property rights and market prospects.” (Source: Jiang, Z. *China's Intellectual Property Rights Protection in 2000*. Retrieved from <http://www.lawinfochina.com/display.aspx?lib=dbref&id=94>)

²⁰² The definitions used in the *April 2010 Draft Notice* (which again, does not look like it was even ever in-force) are herein not considered to constitute IND IP requirements.

²⁰³ Retrieved on August 1, 2012 from <http://www.mofcom.gov.cn/aarticle/difang/anhui/200508/20050800293317.html>.

Note: Translation from the European Chamber thus is unofficial.

1. The term 'Chinese legal persons or organisation without legal personality' means those entities whose original capital composition is not dominated by foreign capital.
2. The term 'leading research or creative design' includes the research or designs conducted through self-innovation or through those cooperation projects that are led by the party who declares the ownership of the research or design result.
3. The term 'intellectual property rights' includes invention patents, design of new technological products, proprietary technology possessing scientific and technological achievements, computer chips (include database, multimedia and internet products), layout-design of IC chips, new animal and plant species, and protection of traditional Chinese medicine."²⁰⁴

- Several Indigenous Innovation Accreditation/Management Measures define indigenous intellectual property rights. For example, the *Hebei Province Indigenous Innovation Product Accreditation Management Rules (Provisional) (2007)*, jointly issued by the provincial MoST, NDRC, and MoF on September 28th 2007 (hereafter the "Hebei IIP Rules"), which appears to still be in effect (see below for further explanation on this point) defines indigenous innovation products as those meeting the following conditions:

Article 6: "Indigenous innovation products applying for accreditation should meet the following basic conditions..."

Article 6.2: "Products have obtained indigenous IP rights and have indigenous brands. Products that have obtained indigenous intellectual property rights are defined as those where the applying unit owns IP products through its own innovative activities, or gain ownership of IP rights that were acquired by the applying unit through assignment by Chinese enterprises, institutions, or citizens who own such IP rights. Products with indigenous brands are those where the applying unit owns the right to the registered trademark of the product."²⁰⁵

- Several Indigenous Innovation Product Accreditation/Management Measures include in their

²⁰⁴ Retrieved on August 2, 2012 from http://www.tjipo.gov.cn/fwz/zspj/zscq/200903/t20090324_14802.html. Note: Translation from the European Chamber thus is unofficial.

²⁰⁵ Retrieved on August 11, 2012 from <http://www.zjkgfw.gov.cn/Project/ShowArticle.asp?ArticleID=537>. Translation is from the European Chamber thus is unofficial. Note: The Hebei Province Department of Finance *Measure on Stopping the Implementation of the Independent Innovation Products by Government Procurement Preferences*, issued by the Hebei Province Department of Finance on July 12, 2011, nullifies Hebei's government procurement preferences as linked to indigenous innovation products accreditation (measure retrieved on August 11, 2012 from http://www.hebgp.gov.cn/upnews/upfiles/zfcg_zcfg/TS_LX20111222162415jg@ng.htm)

²⁰⁶ See Appendix 6 of USCBC (2011) for a helpful listing of these measures.

²⁰⁷ A variety of sources, including WIPO, use the term "indigenous intellectual property rights," but this refers to rights on, for example, cultural works produced by indigenous (i.e. a particular ethnic group of) peoples.

²⁰⁸ As such, while it appears that the aforementioned definitions are those used when interpreting the term, to be completely sure of exactly how the term is applied in practice across *all* Chinese measures mentioning the term deserves clarification with *all* Chinese authorities that use the term. This should be considered when reviewing the measures mentioning indigenous intellectual property rights analysed in this study.

²⁰⁹ SIPO and Peking University Intellectual Property Institute. (2005, October 31). *Study on Major IPR Cases with External Dimensions since China joined the WTO*, p.11. Retrieved on August 12, 2012 from <http://stlaw.pku.edu.cn/UploadFiles/200941714515938.doc>

²¹⁰ "...independent intellectual property rights in China mean that it [the protected invention] is researched, developed, run, and produced by Chinese citizen or Chinese corporation/organisation independently and eventually enjoys the ownership of the intellectual property.... Non-independent intellectual property rights mean that it [the protected invention] is researched, developed, run and produced by natural persons, corporations or other organisations from abroad, and who enjoy the ownership of the intellectual property rights. The main legal bodies holding non-independent IPR can consist of one foreign enterprise, or a combination of a Chinese enterprise and foreign corporations, whereas the eventual proprietary rights belong to an entity abroad, or mainly belong to the foreign side." (Source: Zhonggu Law Online (2011). The contrasting relationship between independent intellectual property rights and non-independent intellectual property rights. Retrieved on August 14, 2012 from <http://news.9ask.cn/zclaw/zczs/smzc/201105/1210223.shtml>)

²¹¹ Consultations with three individuals, one based in Beijing and the other two based in Shanghai, on August 2nd, August 8th, and August 11th 2012 respectively.

definition of “indigenous IPR” an option for restricted licensing of IP fully owned by a Chinese entity in addition to the option of ownership of the IPR.²⁰⁶

- The definition of indigenous IPR including ownership of IPR registered in China or the option of “*an exclusive worldwide license for five years or more*” appear to be particular to several measures underpinning the HNTE tax scheme. These measures are discussed further in section below on that scheme.

For context, a number of government measures using the term “indigenous intellectual property rights” conspicuously do not define the term. As noted in the *Guidance for Enlarging Exports with Indigenous Intellectual Property Rights*, the term as used in China is unique to China²⁰⁷ and in fact the central level, for reasons one could speculate about, does not appear to have promulgated an official definition of the term mandated to apply across all ministries and levels of government.²⁰⁸

Other sources

Key Chinese policy studies and Chinese legal commentaries define indigenous IPR. SIPO & PKU (2005), a policy study commissioned by SIPO to Beijing University, finds that “*Indigenous intellectual property rights refer to the intellectual property legally owned by Chinese citizens, legal persons, or other organisations through their leading research or creative design.*”²⁰⁹ Zhonggu Law Online (2011), among others, notes there is a clear distinction between “indigenous” IPR and “dependent” IPR, finding that indigenous IPR is that owned by domestic entity in China on an invention whose R&D and production was completed in China; and further notes that dependent IPR refers to all IPR, including that jointly held by a foreign and Chinese entity “...belong to an entity abroad, or mainly belong to the foreign side.”²¹⁰

Additionally, consultations with two Chinese lawyers and an ex-government official based in China provide some useful insights into the term. The consultations confirm the term in practice is meant to refer to IPR on core technology owned by a Chinese entity that in no way is reliant on a foreign entity/influence. The consultations also suggest that the term is widely used in a variety of secondary sources and government interpretations as fitting this same definition; and that domestic Chinese companies that those consulted have talked with also interpret the concept in this same way. Additionally, one of those consulted said that while there might conceivably be a few examples of instances where the government has allowed IPR from an entity with majority foreign ownership to constitute indigenous IPR, this will only be to create the veneer of non-discrimination, while most all application of the term intentionally excludes even China-based entities with majority foreign ownership.²¹¹

Different types of IIPs with IND IP requirements

Sub-central level Indigenous Innovation Product Accreditation/Management Measures

While many of the provincial/municipal Indigenous Innovation Product Accreditation/Management Measures that were promulgated in 2006 and 2007 have since clearly been invalidated, other measures, or to be more precise – the provisions of several measures that are not directly related to government procurement preferences – do not appear to be invalidated through a publically available notice(s). Indeed, some measures were fully invalidated at some point in 2011. However, other measures do not appear to be officially invalidated, as while they are flanked by measures that specifically invalidate the government procurement preferences linked to indigenous innovation

product accreditation, they do not invalidate the entire institution of the indigenous product accreditation/management system as set up in the original measures.²¹²

For those provincial/municipal Indigenous Innovation Product Accreditation/Management Measures that appear to be still valid, it is particularly concerning that some contain IPR ownership requirements (as distinct from licensing of IPR owned by a Chinese entity, let alone licensing of IPR owned abroad). By way of one example, the *Hebei IIP Rules*, mentioned above in Box 5, sets forth clear preconditions for ownership of IP rights. Although the rules are flanked by a measure that invalidates government procurement preferences linked to indigenous innovation product accreditation, the rules do not appear invalidated in their entirety by any readily available invalidation notice. The indigenous product accreditation/management system established by the rules also does not appear invalidated.

While the existence of these types of measures are not *per se* concerning given they are delinked from government procurement preferences, it is reasonable to seek assurances that they are not currently being linked to financial incentives *outside* government procurement preferences, and that they will not be linked to any financial incentives in the future. In fact, these concerns are made even more real given evidence presented in below sections within this Chapter that provinces/municipalities are already linking IND IP requirements to certain financial incentives. Generally, IND-IP-based IIPs warrant a number of concerns, the most significant of which are discussed in-depth below. Even at a very minimum, if Indigenous Innovation Product Accreditation/Management Measures have been invalidated through a non-publicly disclosed notice, it is disconcerting they are still published online with no such notification.

In addition to the abovementioned measures, it is worth noting that several provinces in China have Indigenous Innovation Product Accreditation/Management Measures including INDP requirements linked to government procurement preferences for which no invalidation notice, for the government procurement preferences specifically or otherwise, appear to be publically available. These include, for example, measures from Liaoning, Qinghai, and Sichuan.²¹³

²¹² As a general point worth highlighting in this section, given the sustainability of certain government procurement-related policies is scrutinised, requirements in government procurement policies that may be controversial in some respects require objective analysis to determine if they in fact might sustainably contribute to innovation and an economy's development at large. (For example, although not directly tantamount to IND IP requirements, an investigation herein may look into a sometimes controversial tool used to build technology capacity that is linked with government procurement preferences: "offsets." Offsets, which can include technology licensing requirements, are sometimes proposed to build innovation, and an analysis on these as tools to build innovation should be based on questions like those posed in Bleser, Prud'homme et al. (2011) *Trade Sustainability Impact Assessment (SIA) on the Comprehensive Economic and Trade Agreement (CETA) between the EU and Canada: Final Report*. European Commission Trade Assessments, pp 289-290, and pp 304-306. http://trade.ec.europa.eu/doclib/docs/2011/september/tradoc_148201.pdf. If crafted properly, government procurement policies can be used to build industries in ways that can contribute to economic, social, and environmental progress.)

²¹³ *Liaoning Province Indigenous Innovation Product Accreditation Management Rules (Provisional)* issued on August 29th 2009 by the Liaoning Province Department of Finance, and Liaoning Province Department of Science and Technology (retrieved on August 17, 2012 from <http://www.lninfo.gov.cn/kjzx/show.php?itemid=11867>); *Qinghai Province Indigenous Innovation Product Accreditation Management Rules* issued on May 27th 2010 by Qinghai Province Department of Science and Technology (retrieved on August 17, 2012 from <http://www.ghppc.com/html/zhengcefagui/20100527/409.html>); and *Sichuan Province's Indigenous Innovation Product Accreditation Implementing Management Rules (Provisional)* issued in 2009 by Sichuan Province Department of Science and Technology, Sichuan Province Development and Reform Commission, Sichuan Province Economy Commission, and Sichuan Province Department of Finance (retrieved on August 17, 2012 from <http://jscx.scst.gov.cn/NewsContent.aspx?current=%E6%94%BF%E7%AD%96%E6%96%87%E4%BB%B6&NewsID=240>)

Also, while not necessarily as concerning as the central-level and provincial/municipal measures given they may involve comparatively lower value contracts,²¹⁴ it is at least worth noting there are Chinese city-level management/accreditation guidelines for indigenous innovation products that currently do not appear to be officially invalidated nor are flanked by measures invalidating government procurement preference components of the measures. One example is the *Qingdao City Indigenous Innovation Product Accreditation Management Rules (Provisional)*, issued by the Qingdao Science and Technology Bureau on August 1st 2008, stated to be in effect till December 31st 2012 and for which no readily available invalidation notice appears available. The measures set forth clear IND IP requirements linked with government procurement preferences.²¹⁵

Other measures

In addition to the provincial/municipal IIP accreditation catalogues that do not appear to be publically invalidated, this study presents a number of Chinese measures that, in some instances in addition to other concerns mentioned in those sections, clearly make support in the form of subsidies and other financial assistance contingent on IND-IP-based requirements. A non-exhaustive list of examples of these measures includes:

- Sub-central level plans from 2011 that precondition subsidies from S&T and invention-focused funds on enterprises meeting IND IP requirements (see Section “III.3.1.1.1.4 Sub-central level incentives for IP development” for more details).
- Several measures mentioned in Section “III.3.1.1.1.3 CFTDF and similar subsidies” that stipulate IND-IP-based requirements as an exclusive precondition for qualifying for subsidies from a foreign trade fund that, according to even old data, as a whole is worth over RMB 37 billion.
- Measures mentioned in Section “III.3.1.1.2 Standardisation policies” that stipulate IND IP requirements and building of certain standards as a precondition from receiving grants up to 1 million RMB.
- Measures mentioned in Section “III.3.1.1.1.6 HNTE status” underpinning the HNTE tax scheme.
- While not yet explicitly linked to IPR ownership requirements, there are a wide range of recent Chinese policies that promote the future (e.g. by 2015) development of IPR ownership, inclusive of patent ownership, by China-based entities in a way that is worth seeking assurances that these policies will not be implemented via IND-IP-based measures. The “Chapter 3” section (as well as the “Chapter 2” section) in the Annex provides an overview of some of these policies.

²¹⁴ Note: City-level procurement is often of comparatively lower monetary value (this said, in China, these amounts are still quite sizeable given the size of its cities), and it is not unusual for it to be excluded from the commitments of parties to the WTO’s Government Procurement Agreement (GPA) (to which China has not even yet acceded).

²¹⁵ Part 4: “Accredited Indigenous Innovation Products will be listed and published in Qingdao City Indigenous Innovation Product Catalogue... When the municipal government organs, institutions and group organisations use fiscal fund for government procurement they should therein prioritise products that are included in the Qingdao City Government Procurement Indigenous Innovation Product Catalogue...”

Part 6: “To qualify as an accredited indigenous innovation product, a product needs to meet the following requirements:”

Part 6, Article 2: “Products possess independent intellectual property rights, and have a clear equity situation. That is to say, through dominant technological innovative activities, applicant units own intellectual property rights in China by law; or through legal transfer or permit, Chinese enterprises, institutions or citizens obtain the ownership or the right of use for intellectual property rights in China by law.” (Measure retrieved on August 15, 2012 from <http://china.trade2cn.com/news/NX70ltD355S0sv0-1.html>). Translation is from the European Chamber thus is unofficial.

Assessing the contribution of IND-IP-based IIPs to innovation and patent quality

It is important to assess if rewarding enterprises according to IND-IP-based criteria as listed in the aforementioned IIPs is a useful incentive to build patent quality and innovation. (While *all* such references do not necessarily mention “patents” specifically, given the context of the measures, it is clear that the provisions are intended to encompass patented products.) From one vantage point, the aforementioned IND-IP-based IIP schemes indeed seem to help to build domestic enterprises: indeed self-owned brands and self-owned patents (or other forms of IP) collectively can be a metric of the innovation capacity and competitiveness of an entity. However, this viewpoint deserves further analysis, particularly in terms of what factors determine transfer of IPR ownership vs. IP licensing in China, and if China’s preoccupation with IND-IP-based IIPs, at least the type that appear to be currently conceived, is the best way to stimulate innovation and related quality patents. These issues are briefly discussed in Box 6 and Box 7 below, and the text following those boxes.

Box 6: Why might China be preoccupied with IND-IP-based IIPs?

Why the preoccupation with IND-IP-based policies?

It is quite clear from its IND-IP-based IIPs that China wants to build-up Chinese entities’ ownership of IPR, and that policymakers believe IND IP IIPs a useful way to do so. Within this drive to build up ownership of IPR, Chinese policymakers inferably view IND IP IIPs as important for a number of more specific, sometimes inter-related reasons. Among potentially other rationales, such policies might be argued by the government to create exogenous incentives for Chinese entities to:

- Build indigenous innovation strength which in turn strengthens the perception of China as an innovator, which creates spillovers in terms of building reputation abroad which can translate into various economic gains;
- Build indigenous innovation strength which in turn stimulates nationalism at home which further stimulates domestic innovation; and
- Contribute to China’s national economic security by ensuring a strong foundation of domestically-owned patents.

The policies might also be argued by the government to supplement the incentives endogenous to building IP ownership experienced by Chinese entities, namely the ability to:

- Enjoy protection on inventions which encourages further investment in R&D and other inputs of innovation to create other inventions in China;
- Enjoy higher royalties that must be paid when the technology is licensed and/or otherwise strengthen bargaining with competitors;
- Avoid paying the aforementioned royalties to another (e.g. foreign) entity;
- Use litigation grounded on an owned patent to drain competitors’ resources and thus put them at a competitive disadvantage;
- Deter litigation by threatening to countersue with an owned patent; and
- Block competitors’ development in a certain field by monopolising patent ownership in that field.

Are these solid policy arguments for why IND-IP-based IIPs as currently conceived will best create quality patents and related innovation?

The general idea that IND-IP-based IIPs may optimally encourage patent quality and related innovation, particularly breakthrough innovation, in China is questioned in the text following this box. In short, to the extent IND IP requirements are linked to discriminatory practices, for example subsidies, as mentioned in subsequent sections in this Chapter, they may hamper the end goal of

building patent quality and related innovation.

In addition to this analysis, some of the more specific abovementioned reasons for IND-IP-based IIPs in China deserve scrutiny. For example, it should at least be noted that IP royalties are not necessarily always a very significant part of profit for certain companies, although are certainly important in some cases.²¹⁶ It is also apparent that Chinese entities' overuse of patents as "weapons" in litigation has caused waste of public resources and hampers innovation and building of quality patent in China (these issues are further discussed in Chapter 4 hereto).

Four reasons why China's IND-IP-based IIPs as currently conceived may not stimulate breakthrough innovation and patent quality as well as envisaged by policymakers:

This section must be premised by again saying, as mentioned above, that a desire to boost indigenous intellectual property rights and indigenous Chinese innovation is by no means a negative policy objective, and in fact in principle goes hand-in-hand with the larger objective of boosting innovation and patent quality in China; however, the devil is in the details in terms of the exact types of efforts undertaken to achieve this goal. As such, it is important to critically assess if China's IND-IP-based IIPs as currently conceived will actually best stimulate innovation, particularly breakthrough innovation, and related patent quality. Although there is an absence of detailed studies empirically assessing these dynamics, and some ambiguity in the exact legal requirements of some IND IP IIPs,²¹⁷ this study posits a number of potential problems with China's current IND-IP-based IIPs showing they very well might not stimulate breakthrough innovation and associated patent quality as well as perhaps envisaged by policymakers.

First, overemphasis of what could be termed 'IND IP thought' in Chinese IIP can indoctrinate the policymaking system in a way that prevents creation and implementation of other domestic Chinese innovation policies that could be more helpful for building-up quality patent filings and related innovation. The preoccupation with IND IP can overly indoctrinate the policy formulation process, in effect steering policy in only one direction (the IND IP-related direction). This would not necessarily be a problem in the IND IP criteria plus financial incentives formula was a rigorously proven (e.g. via empirical economic analysis) approach towards optimally stimulating innovation; however, it does

²¹⁶ Note: For example, in 2010 royalty revenue as a share of total revenue for Philips was only 1.86%, for Ericsson was only 2.26%, and for Astra Zeneca was only 1.61%. That said, there are other firms where royalty revenues make up a significantly higher share of their total revenue, and it is likely that such royalties would be very important for SMEs. (Source: WIPO [2011], p. 64)

²¹⁷ Of note, it is not fully clear on paper to what extent Chinese entities need to own all IPR (or be licensed IPR from Chinese entities owning such IPR) on specified products to qualify under many of the indigenous innovation product accreditation programs that were reviewed. There does not appear to be clear requirements across all measures on the *exact extent* of ownership (or licensing) of products required, for example all the measures do not clearly require ownership for 100% of all IP relevant to specified products. Although certain measures reviewed say "ownership and interest shall be clear and 'stable'" and "a product can have more than one invention patents, utility patents, software copyrights and innovated brands," it is not fully clear, on paper at least, about the handling of an instance where one product is indeed associated with more than one related patent with different ownership structures. In the absence of such requirements, a Chinese entity could theoretically qualify under the IIPs as having "indigenously innovated" products if they only own (or are licensed) one (or a few) patents from Chinese entities (perhaps of dubious value) on specified products, whereas there are other patents on that product owned or licensed by entities based abroad. And further, therein the company's real competitive advantage (even in terms of the product in question) could in fact be derived from other factors.

However, all of this said, drawing from the more specific definitions of "indigenous intellectual property rights" in other measures outside the product accreditation IIPs reviewed, and upon review of secondary sources and consultations with experts in China, it seems likely that *in practice* an entity with an *ideal* "indigenous innovation product" would meet *typical* IND IP requirements, i.e. the entity would be Chinese (without foreign majority ownership) and have 100% ownership of all IPR associated with that product.

not appear to be. Thus, if alternative views were better heeded and different, more proven, policies crafted and implemented, at least in addition to these IND-IP-based policies, this could very well more optimally stimulate domestic innovation and patent quality in China. Allowing licensed IP from entities abroad would in itself be a more positive policy approach than the IND IP approach, the same, well-recognised conclusion manifested in the *April 2010 Draft Notice*. Other alternative approaches could be considered, for example, criteria for substantial *and* productive investments in R&D (which do not appear to be criteria in many of the IND-IP-based IIPs measures reviewed²¹⁸).

The comparative power of certain personalities in ministries making innovation policy, e.g. MoST above MOFCOM, might exacerbate genuine collegial creation of the best innovation policies herein, whereas a more collegial approach is likely ideal given the multi-faceted nature of innovation policymaking which requires expertise in S&T issues, patents, investment, tax, among other areas. And even herein, on one hand although there is indeed evidence of an ostensible dialogue between the ministries, on the other hand the policies produced therein may still reference potentially disconcerting IIPs. For example, albeit not explicit, there is a potentially concerning link between financial incentives and “IP rights obtained from indigenous innovation activities” in the latest *2012 National IP Strategy*.²¹⁹

Second, given decision-making of foreign enterprises, it seems unlikely that IND-IP-based policies will effectively push (or pull) competitive foreign firms at large to increasingly transfer ownership of IP to Chinese entities, particularly quality IP, and in fact may encourage them not to transfer ownership of IP or even license IP (exclusively or otherwise) to Chinese entities. While the obvious objective of such IND-IP-based policies is to build *indigenous* innovation capacity as distinct from that built upon foreign innovation, it seems highly unlikely that the policies intend to *discourage foreign* companies from transferring much needed know-how to and developing much needed know-how in the Chinese market. To be sure, it is well-recognised by the Chinese government, as reflected in a wide variety of policy statements mentioned throughout this study, that foreign know-how, if utilised properly, is one crucial building block for innovation in China.

IND-IP-based policies will likely not stimulate further foreign ownership or licensing transfers of quality IP to Chinese entities because, despite the occasional anecdotal examples to the contrary, empirical evidence over the last 20 years presented in Chapter 1 suggests that foreign enterprises at large avoid transferring breakthrough technology via licensing let alone transferring ownership to China or otherwise developing world-class technology in China. (For context, a variety of studies note that multinational companies use different methods of technology transfer, which may include licensing and ownership transfer, depending on the level of IPR protection in a host country.²²⁰) This

²¹⁸ There are exceptions. For example, requirements in the *Indigenous Innovation Product Accreditation Management Rules of Dalian, in Liaoning Province*, issued on Dec. 2008, Dazhengban Fa [2008] No.203 by Dalian Municipality, in Article 2 (2) find: “The proportion of funding input for high-technology and products R&D in the enterprise last year should account for more than 5% of annual sales revenue.” Of note, Hebei, in its annex, generally states that enterprises which are recognised as the manufacturer of independent innovation products should report their R&D funding each October.

²¹⁹ While they do not explicitly reference IP “ownership,” the focus on “IP rights obtained” as linked to indigenous innovation activities in S&T projects is mentioned in Part 1, measure 1 and 2 of the latest *2012 National IP Strategy*, to which 28 government bodies contributed, and should at least be monitored. Part 1, measure 1: MoST: “Revise the Assessment Index System of National Technology Invention Awards, enhance the assessment on patent quality, increase the rewards to significant technological inventions and IP rights obtained through indigenous innovation activities.” Part 1, measure 2: MIIT: “...give priority and assistance to projects which obtained IP rights through indigenous innovation activities, specify the acceleration of indigenous innovation capacity building...” (emphasis added)

²²⁰ Maskus (2000) notes there are three ways to transfer technology across international borders: trade through goods; foreign direct investment (FDI) within enterprises (multinationals, in particular); and contractual licensing of technology among unaffiliated firms, subsidiaries and/or joint ventures. The same study finds that FDI, often a main method of patent ownership transfer, rises only when patent rights are strengthened to levels with which enterprises are comfortable, otherwise licensing agreements are preferred. (Source: Maskus, K. E. (2000). *Intellectual property rights and economic development*. Paper for “Beyond the Treaties: A Symposium on Compliance with International Intellectual Property Law” at

is due to fears over China's IPR protection environment and given these firms' market power. Consultations within the European Chamber find that this generally represents decision-making of some of the biggest and most competitive multinationals, most of who have been operating in China for decades.²²¹ The aforementioned IND-IP-based IIPs do nothing to alleviate the fear about the quality of the IPR environment in China, and given their discriminatory nature in fact worsen foreign enterprises' perception of the friendlessness of the innovation environment at large in China. And this likely holds even with the economic downturns in the rest of the world and the comparative attractiveness of the Chinese market acting as a pull factor.

To be sure, this trend will also apply to foreign SMEs as well as multinationals. INSME (2011) notes that to-date European firms most commonly transfer their technology to Chinese firms via licensing agreements as opposed to transferring ownership, adding that many of these technology transfers are not even in the areas of high-technology but in low technology, or consumer or industrial products.²²² And even for new SMEs with highest-quality patents looking to take advantage of opportunities in the Chinese market, there is a strong reluctance, given IPR enforcement concerns among other issues, to establishing any operations in China, let alone transfer ownership of technology to Chinese entities.²²³ The aforementioned INP IP IIPs do nothing to improve foreign SMEs' perception of the IPR enforcement environment in China, and in fact worsen their perception on the innovation environment at large in China.

As a note, this trend is further reinforced by the fact that even if "worldwide rights to exclusive use" is allowed in some measures as an option in meeting IIP IPR requirements, this option cannot be practically met, as current Chinese law effectively prohibits an owner/licensor from retaining IP usage rights in a foreign jurisdiction, and also prohibits any other person, including a subsidiary of a foreign enterprise from receiving a sublicense from the China licensee.²²⁴ This further undermines the ability of IIP IPR requirements to spur patent quality and related innovation. (For more on this specific point see the later section in this Chapter on the HNTE scheme.)

Third, and in a related vein to the second point, China's IND-IP-based IIPs may even have some push effect of encouraging some companies to develop certain initiatives in alternative regions where they can contribute to quality patents and local innovation. Innovation investments by companies in EU Member States in particular may be increasingly pushed away from China towards India, the US and Canada, Eastern Europe, Japan, other EU Member States, among other places. Obviously this decision-making is based on a wide range of pull factors, but when also compounded with the push factors mentioned in the Introduction to this study and other places throughout (e.g. IPR enforcement concerns, lack of access to credit, shortage of talent in certain areas) may ultimately create a more notable drag on innovation and related development of quality patents in China than if such policies were replaced with more palatable ones.

Case Western Reserve University. Retrieved from University of Colorado, Department of Economics. Web site: <http://www.colorado.edu/Economics/mcguire/workingpapers/cwrurev.doc>. McDaniel (1999) finds that in large markets with both high potential returns on investment (ROI), although firms prefer to utilise FDI despite its comparatively higher fixed costs, as opposed to licensing which has lower fixed costs but also a lower ROI, if uncertainty surrounds security of patent rights (even in countries with a high market potential, as in Japan in the 1980s and 1990s), IPR licensing is used as an alternative to patent transfer via FDI given too much IPR leakage in the latter. (Source: McDaniel, C. (1999). *Inventing around and impacts on modes of entry in Japan: A cross-country analysis of U.S. affiliate sales and licensing*. Office of Economics Study, USITC. Retrieved from http://www.usitc.gov/publications/332/working_papers/EC9911A.PDF). Among other sources discussing related phenomena, see Maskus (1998).

²²¹ 13 March 2012 - Consultations with several European Chamber members in Shanghai

²²² INSME. (2011). *Technology transfer to China: Guidance for businesses*. Retrieved from http://insme.org/insme-newsletter/2011/file-e-allegati/newsletter_documents/Technology_transfer_to_China_FINAL.pdf

²²³ 2012, March 23- Consultations on SMEs' internationalisation in China with a DG Enterprise representative

²²⁴ Orrick. (2010, January). *China income tax preferences for high/new-tech enterprises (HNTE)*. Orrick Tax Law Update. Retrieved from <http://www.orrick.com/fileupload/2420.pdf>

As noted in Box 4 in Chapter 1, Chinese and EU companies suggest that access to government-sponsored sources of finance is critical in allowing them to boost patent creation and utilisation. Survey data from EU companies suggests that outside access to key talent, access to public grants, fiscal incentives, and public loans and guarantees are some of the most important factors affecting EU companies' innovation plans and activities.²²⁵ Consultations also suggest that access to the aforementioned types of financial support is a key factor affecting many private Chinese companies' (including those using IPR sometimes licensed from foreign entities) innovation plans and activities.²²⁶ As such, in order to better attract certain innovators from the EU (particularly those that are not as well-funded as others), and also to fully stimulate many private Chinese enterprises, China's innovation policies should be crafted in a way that does not unnecessarily exclude potential innovators; however, IND-IP-based IIPs do not appear to most objectively reflect these policy considerations.

Further, to the extent that other countries have policies that do not overemphasise IND-IP-based IIP-style policies which in effect may 'crowd out' licensing from abroad, they may pull in some licensed IPR that China could have otherwise realised without its IND IP IIPs. This may arise to the extent that IND-IP-based IIPs overly discourage IPR licensing, whereas IPR licensing is one important method to build innovation, and such an approach would discourage licensing spillovers that could lead to development of quality patents. There is solid potential for more licensing from foreign firms in China as well as those not yet in China but looking to expand there, whereas Giuri and Torrisi (2011) find there is still a significant potential for firms from high-income countries to license their patents in China, as gauged by their current plans to do so or lack of utilising such options as of yet. Amongst European firms in particular, roughly 24% have patents they apparently would be willing to license (although the data does not say to whom exactly) but have not yet done so.²²⁷

The overemphasis conundrum also applies to the extent that IND-IP-based-IIPs might overly discourage policies stimulating "open innovation," the concept that firms can share/use internal and external ideas and paths to advance their technology, which is sometimes considered to be hindered by less than optimal IPR regimes.²²⁸ Open innovation in some circumstances may better enable building breakthrough innovation and in the longer term also lead to quality patent filings.²²⁹

Additionally, given the globalised nature of production chains at present, which are dispersed throughout a variety of countries and will likely inevitably continue to be dispersed to take advantage of comparative advantages, China's justification for IND IP policies based on national economic and technological security may be less convincing than otherwise assumed. Specifically, licensing of technology and other forms of knowledge-sharing outside that necessitated by IND IP

²²⁵ European Commission, (2010), p. 17

²²⁶ 2012, April 17- Consultations with several members of the European Chamber in Shanghai

²²⁷ Giuri, P., & Torrisi, S. (2011). *The economic uses of patents*. Munich, Final Conference of the InnoS&T project "Innovative S&T indicators for empirical models and policies: Combining patent data and surveys"; and WIPO (2011), p. 65

²²⁸ Among others see: Lee, N., Nystén-Haarala, S., & Huhtilainen, L. (2010). *Interfacing intellectual property rights and open innovation*. Retrieved from http://www.wipo.int/edocs/mdocs/mdocs/en/wipo_ipr_ge_11/wipo_ipr_ge_11_topic6.pdf

²²⁹ Note: Herein, it should be considered that open innovation and other public disclosure of inventions are important for building-up innovation and leading to future quality patent filings. Baldwin and Von Hippel (2010) use empirical evidence to suggest that ownership of IPR is not as essential to innovation as perhaps assumed, whereas open source innovation can very much lead to key innovations. (Source: Baldwin, C. Y., & Von Hippel, E. A. (2010). *Modeling a paradigm shift: From producer innovation to user and open collaborative innovation*. Harvard Business School Finance Study, No. 10-038. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1502864). WIPO (2011) also suggests that there can be a place for open innovation, for example, among research institutes and universities, to spur important innovations. Also, it is well-known that a significant amount of information used to build future patents is taken from publicly available information on already granted patents. As a result, an entity can benefit from open innovation and others' patent filings in creating its own innovation.

requirements are increasingly underpinning much of the global operations of many entities of many nationalities.

Fourth, IND-IP-based IIPs may be in violation of WTO rules, particularly Article 3 (on national treatment) of the *Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement*, and thus if effectively challenged will need to be replaced by a strategy that less discriminatorily attempts to promote innovation.²³⁰ It may be prudent for alternative strategies for boosting innovation and quality patents to already start taking the places of these type of IIPs rather than allowing them to exist as a core part of China's innovation policy and thus preempting any lags in efficiency that might result between required nullification of the policies and crafting more appropriate new ones.

Side note: So what policy tools might encourage IP transfers?

As IP transfers were mentioned earlier in this section, it should be noted that promoting trade gains may be one alternative to encourage IP transfers. Galasso et al. (2001) finds that patents with higher potential gains from trade are more likely to experience a change in ownership.²³¹ As such, there is at least some indication that if the authorities can build the economy in a way that provides further trade gains, foreign companies then could increasingly transfer IP ownership to China-based entities. This said, it is important to contextualise Galasso et al. (2001) with the findings of Hu (2008) and the other innovation trend-related background information in Chapter 1 of this study.²³²

III.3.1.1.1.3 CFTDF and similar subsidies

There is concerning evidence of large Chinese subsidy funds that are built on discriminatory IND-IP-based requirements as well as continent on export performance. Some of these subsidies fall within China's Central Foreign Trade Development Fund (CFTDF), a large fund investigated in this study which has surprisingly seemed to fly under the radar of most observers.²³³ According to a Chinese government-supported audit report, it appears that up until 2004 the income from quota bidding (a typical funding source for China's subsidy programs) channelled into the CFTDF reached RMB 37.7 billion, among which RMB 29.5 billion had been allocated to enterprises qualifying for the fund. Only RMB 3.5 billion, or 12% of the amount allocated to enterprises qualifying for the fund, was distributed in the form of loans, whereas RMB 25.7 billion of the fund was very likely given in the form of grants. These monies were given to 247 projects, and out of those projects 103 (41.7% of the

²³⁰ For one analysis of a potential WTO case herein see: An, S., & Peck, B. (2011). China's indigenous innovation policy in the context of its WTO obligations and commitments. *Georgetown Journal of International Law*. Retrieved on March 30, 2012 from <http://giiil.org/wp-content/uploads/archives/42.2/ChinasIndigenousInnovation.pdf>. (pp 437-442 of that paper note that certain IP-specific provisions in China's IIPs appear to be in violation of Article 3 as well as Article 27.1 of the *TRIPS Agreement*). Note: In the opinion of this study, IND IP requirements may conceivably conflict with Article 3 of *TRIPS*, which stipulates national treatment of "protection" of IPR (however, an argument based upon Article 27.1 seems less convincing). As a very important caveat, however, it would be absolutely necessary to fully investigate how Footnote 3 in Article 3 of *TRIPS* is intended to be applied, whereas that footnote defines "protection" of IPR as: "For the purposes of Articles 3 and 4, "protection" shall include matters affecting the availability, acquisition, scope, maintenance and enforcement of intellectual property rights as well as those matters affecting the use of intellectual property rights specifically addressed in this Agreement." A further analysis of these dynamics is well beyond the scope of this study.

²³¹ Galasso, A., Schankerman, M., & Serrano, C. J. (2011). *Trading and enforcing patent rights*. Retrieved from http://www.economics.utoronto.ca/serrano/papers/GSS_paper.pdf

²³² Note: Recall Hu (2008) finds that patent filing trends in China do not follow the market covering hypothesis; however, Hu (2008) focuses on IP filings, whereas the findings in Galasso et al. (2001) relate to IPR ownership transfer (post-filings). As such, Hu (2008) does not necessarily challenge the aforementioned findings.

²³³ See Prud'homme, D. (2012, forthcoming). *The biggest subsidy scheme nobody's heard of: China's Central Foreign Trade Development Fund*. European Chamber Working Paper. Note: many subsidies herein are clearly discriminatory and violate WTO obligations in the *SCM Agreement*, namely Article 3 on prohibited subsidies and Article 5 on actionable subsidies, and as related to export subsidies in some cases conflicts with Paragraphs 166 and 167 of the Report of the Working Party on the Accession of China.

projects which received loans) did not even repay their fund loans on time (thus the amount of unrepaid loans to the CFTDF totalled RMB 980 million, which was 27.66% of the total funds distributed for loans).²³⁴

Some examples of these discriminatory subsidies are listed below:

- *Administrative Measures for Research and Development Fund of Export Products* issued by MOF and the Ministry of Foreign Trade and Economic Cooperation (former version of MOFCOM), which is one of the earliest relevant measures found during research for this study, and is still effective:²³⁵

Article 2: *“The term export R&D funds in this measure means the government funds drawn from the Central Foreign Trade Development Fund as a subsidy that does not need to be repaid to support research and development of export products.”*

Article 8: *“The export R&D funds will as a matter of priority provide subsidies for enterprises and projects meeting the following conditions:*

(1) According to Customs statistics, last year’s export volume accounts for more than 50% of the total sales revenue or exports are worth more than 15 million U.S. dollars...

(5) Have indigenous intellectual property rights...”²³⁶

- *Application Guidance for Fund for the Optimisation of Import & Export of Machinery & Electrical Product and High-Tech Products*, issued on September 3rd 2007 by MOFCOM and MoF, which provides free financing of labor costs, equipment costs, fuel and power costs, rental fees, testing fees, material fees, “commissioned development fees”, and “appraisal and acceptance fees.” The main IND-IP-based and export restrictions for qualifying for these funds are:

Part 4, Article 4: *“an R&D project must...generic technology programs should have indigenous intellectual property and related entities should have clear intellectual property rights.”*

Part 2, Section 2, criteria 2: *“...last year’s exports accounted for more than 50% of the total sales revenue or enterprise exports more than 15 million U.S. dollars.*

Part 2, Section 4: *“Special funding support includes:*

Article 4.1: Free financing;

Article 4.5: The amount of subsidy for construction programs for base public service platforms average no more than 10 million RMB, significant programs no more than 20 million RMB, and the amount of subsidies for single enterprise programs average no more than 3 million RMB.

Article 4.7: Funds will be appropriated in two stages: first for 60% of funds after approval, and the other 40% funds will be given after programs are accomplished and qualifications are verified.”²³⁷

²³⁴ Shandong Institute of Internal Audits. (2005, November 4). *Audit shows the disadvantages of Foreign Trade Funds*. Beijing News. Retrieved on April 15, 2012 from <http://www.sdiia.gov.cn/yznews/showdetail.aspx?id=4543>

²³⁵ No readily available notice appears to be issued nullifying or superseding the measure when last checked on August 17, 2012.

²³⁶ Promulgated on November 27, 2002, last retrieved on April 30, 2012 from <http://www.zwgk.suzhou.gov.cn/dpt/show.asp?ID=18598> Note 1: Translation from the European Chamber thus is unofficial. Note 2: There is no definition of the term “indigenous intellectual property” in the measure itself.

- *Notice on Good Performance of the Construction Fund for Guangdong Export Bases of Agricultural, Light Industry and Textile Products for the year of 2011* issued on June 14th 2011 by the Department of Foreign Trade and Economic Cooperation of Guangdong Province and Department of Finance of Guangdong Province:

Section 1, Part 1: *“The source of the fund for agricultural, light industry and textile products is the Guangdong Foreign Trade Development Promotion Fund according to the new provincial financial arrangements of Guangdong....”*

Section 1, Part 2: *“The fund is implemented and managed by programs and the fund is used as a grant...”*

Section 1, Part 3, Para. 1: *“...The support scope of the funding includes covering the expenditure for instruments and equipment (not for production use), software, expert advice and information and certification needed for R&D, design, quality control, and product testing of export enterprises as well as the expenditure such as venue rental costs for activities.”*

Section 3, Para. 3: *“The enterprises that apply for the public technology platform program for agriculture, light industry and textile product export should have indigenous intellectual property rights...”*²³⁸

As mentioned, the above list is *non-exhaustive*. In fact, research for this study has uncovered a variety of other policies existing under the CFTDF that include IND-IP-based requirements, as well as export and other preconditions for receiving subsidies.²³⁹

Further, it is worth further investigating if such subsidies, or related subsidies, are linked or will be linked to targets in certain recent provincial IP plans and strategies (e.g. Provincial/Municipal 12th Five Year IP Plans reviewed in this study, different components of which are mentioned in the “Chapter 2” and “Chapter 3” sections in the Annex).²⁴⁰ In fact, this link would not necessarily be a new policy initiative. For example, although less than 100% explicit, it appears to still be relatively clear from a number of recent past measures, like the below-mentioned measure, that Chinese policy targets for IND IP and export growth have a history of being linked to CFTDF subsidies:

- *Opinions on Accelerating the Transformation of the Export Growth of Electromechanical Products within the period of Eleventh Five Year*, issued on May 27th 2006 by MOFCOM, NDRC, MoST, MoF, MIIT, the People’s Bank of China (PBoC), General Administration of Customs (GAC), State Administration of Taxation (SAT), and General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ):

Section 1, Article 2: *“...by 2010 the export volume of high-tech electromechanical products to account for 55% of the total export...the proportion of export*

²³⁷ Retrieved on April 22, 2012 from http://www.smes-tp.com/Article_Show.asp?ArticleID=32448 Notes: Translation from the European Chamber thus is unofficial. This measure was only intended to be effective in 2007. There is no definition of the term “indigenous intellectual property rights” in the measure itself.

²³⁸ Retrieved on April 30, 2012 from <http://www.gddoftec.gov.cn/admin/UploadFile/2011621161019379.pdf> Notes: Translation from the European Chamber thus is unofficial. This measure was only intended to be effective in 2011. There is no definition of the term “indigenous intellectual property rights” in the measure itself.

²³⁹ Note: While these aforementioned criteria may be concerning, it is important to note that some of these measures include criterion for R&D output, which as mentioned in the IND-IP-based IIPs section and related Recommendations in this Chapter in fact is, in the view of this study, a useful criterion for innovation funding.

²⁴⁰ For example, among others, an indicator in *Hunan’s Provincial Intellectual Property Strategies Outline* of February 26, 2009 sets forth an objective that *“indigenous intellectual property rights and indigenous brands’ exports to reach ≥ 20% and ≥ 50% respectively of total export volume.”* (see the “Chapter 2” section in the Annex for further indicators from provincial IP proposals.)

electromechanical products which own indigenous brands and indigenous intellectual property rights to account for 20% of the total export volume of electromechanical products.”

Section 5, Article 18: “Continue to annually withdraw a sum of money from the Central Foreign Trade Development Fund to mainly support the R&D and subsidised loans of technical transformation of export electromechanical products, and when conditions permit, localities should also be given financial support.”²⁴¹

From one vantage point, the aforementioned subsidy schemes indeed might help to build domestic enterprises, given self-owned brands, self-owned patent rights, and sales records collectively can be a metric of the competitiveness of an entity. So rewarding enterprises meeting such criteria might seem like an obviously useful incentive.

However, for the same four reasons mentioned in the previous IND-IP-based IIPs section, with some supplemental details to those reasons, it appears that the abovementioned subsidy approaches will not necessarily best encourage quality patent filings and related innovation in the ways ostensibly envisaged. Regarding the differences in details, in terms of the fourth reason from the IIPs section on WTO conflicts, the subsidies mentioned in this section not only potentially contradict the *TRIPS Agreement* but are also clearly in contradiction with Article 3 of the WTO’s *Subsidies and Countervailing Duties (SCM) Agreement*, among other provisions in China’s WTO commitments.²⁴² (And note that the above cited measures were not specifically mentioned in the apparently resolved case filed against China on its China World Top Brand Programme and Chinese Famous Export Brand Programme.²⁴³) Thus, replacement strategies will need to be put in place by the Chinese authorities if these and related subsidy policies and their implementing measures are effectively challenged.²⁴⁴

Additionally, requiring patent-ownership-related criteria for high-exporting enterprises may be unnecessary as it may not establish innovation and competitiveness-building incentives in the most efficient and effective ways. Specifically, empirical evidence across a range of countries suggests that export capacity is already one of the most statistically significant indicators of patent filings.²⁴⁵ As

²⁴¹ Retrieved on May 16, 2012 from <http://www.mofcom.gov.cn/aarticle/difang/ningxia/200609/20060903039965.html>
Notes: Translation from the European Chamber thus is unofficial. Although there appears to be no readily available notice that invalidates this measure, it inferably was only intended to be effective during the time of 11th Five Year Plan (i.e. 2006-2011). There is no definition of the term “indigenous intellectual property rights” in the measure itself.

²⁴² Several subsidies in the CFTDF violate WTO commitments in the *SCM Agreement*, namely Article 3 on prohibited subsidies and Article 5 on actionable subsidies, and as related to export subsidies in some cases conflicts with Paragraphs 166 and 167 of the Report of the Working Party on the Accession of China. (Source: Prud’homme (forthcoming 2012))

²⁴³ Specifically, DS387, initiated by the US on December 19th 2008 and joined by Australia, Canada, Colombia, Ecuador, the European Communities, Guatemala, Mexico, New Zealand and Turkey in January 2009. The press reported the USTR signed an agreement with China to remove “numerous subsidies” mentioned in the DS387 case (source: China resolves WTO case by ending subsidies on ‘famous brands’. (2009, December 20). *Bloomberg*. Retrieved from <http://www.business-standard.com/india/news/china-resolves-wto-case-by-ending-subsidies%5Cfamous-brands%5C/380109/>). USTR (2011), pp 70-71, also note that the case was resolved in December 2009. This was further confirmed in the author’s consultations with a representative from USTR in March 2011. For details of the request for consultations evidence see: WTO. (2009, January 7). *China – Grants, loans and other incentives: Request for consultations by the United States*. WT/DS387/1. (Document No 09-0022, pp. 1-18). Retrieved from <http://docsonline.wto.org>

²⁴⁴ Note: The reason such subsidies are not allowed under the WTO framework is not necessarily that they do not “work at all” in building-up enterprises, although some certainly argue this, rather that countries have agreed to mutually limit discriminatory rules with a view to allowing market forces and more ‘neutral’ support mechanisms to determine the most competitive industries.

²⁴⁵ Note 1: Blind (2006) looks at patent applications at the European Patent Office (EPO) and finds an upsurge in patent activities cannot be explained by expansion in R&D expenditures, but rather the most powerful indicator of international patent applications is export volumes. (Source: Blind, K. (2006). Chapter 5: Driving forces of patent applications at the European Patent Office: a sectoral approach. In Hingley, P., & Nicolas, M., *Forecasting innovations: Methods for predicting numbers of patent filings*, pp. 73-94. Heidelberg, Germany. Springer.) Note 2: Encaoua et al. (2000) also finds that

such, firms that export already have the incentive to protect their patents (and trademarks, and other forms of IP) abroad without such CFTDF subsidies. This said, perhaps surprisingly, it is apparent that some Chinese firms, for example some SMEs, that export knowledge-intensive goods and services abroad do not actually register their IPR abroad.²⁴⁶ Either way, given the previously mentioned drawbacks in the specific subsidies, such funds might better be used to build-up innovative enterprises and support patent quality in different ways not necessarily based on IND IP export criteria.²⁴⁷

III.3.1.1.1.4 Sub-central level incentives for IP development

Just based upon the recent IP proposals reviewed for this study, it is clear that many provinces in China have set-forth special award programs and are intent on utilising a number of financial incentives to spur development of quality patents. Many of these initiatives seem commendable. For example, Anhui sets out an Anhui Patent award “to improve patent quality” and Hebei notes the need to calibrate financial funding for patent initiatives based upon differences in enterprises size, location and stage of development. Jiangsu looks into establishing a “Patent Bank;” sets out an initiative that registered patent intermediary service organisations engaged in patent technology development and other practices can be exempted from the business tax (BT) and education surcharge; notes that financial investment in developing IP should outpace immediate ROI; among others. Liaoning promotes a 500,000 RMB Gold Award for China Patents and a 200,000 RMB China Patent Excellence Award. Ningxia promotes similar awards to Liaoning, and mentions setting-up special funds to stimulate invention patents. A number of provinces provide funding specifically for registering patents abroad. Other IP proposals reviewed also have seemingly relatively well-aimed financial funds to build patent quality. (Note: these award programs are not concerning if they do not include IND IP-type criteria.)

There are also provinces/municipalities that while setting out some commendable initiatives in the provincial/municipal IP proposals reviewed in this study also set out potentially concerning provisions. For example, on one hand, Tianjin’s 12th Five Year IP Plan (from 2011), sets forth a variety of interesting financial plans, including a “Tianjin Patent Award,” “Worker Inventor Award,” “Women Inventor Award,” and “Juvenile Inventor Award,” and promotes the “One Award, Two Remuneration” system.²⁴⁸ However, on the other hand, the Tianjin plan also sets out advice that funding from specific government funds from the key technology invention project fund, science and technology invention fund, and technology invention fund for SMEs should “tilt towards enterprises with indigenous intellectual property rights.” Table 13 below illustrates these financial incentives.

propensity to patent solutions rises as exports rise, whereas exporting firms face more competition and thus increasingly need to protect knowledge-based resources (Source: See Encaoua, D., Hall, B. H., Laisney, F., & Mairesse, J. et. (2000). *The economics and econometrics of innovation*. Dordrecht, Netherlands. Kluwer Academic Publishers.)

²⁴⁶ Consultations with several Chinese companies in the nutrition and machinery industries on April 12th 2012 and April 18th 2012. Note: Without government consultations it is unclear how much this phenomenon plays into the rationale behind the aforementioned subsidy policies.

²⁴⁷ To be sure, for the reasons mentioned, this is despite the fact that, as found in Girma et al. (2009), export subsidies at large (although not necessarily those in the CFTDF specifically) could indeed boost exports of Chinese firms in capital-intensive industries that may see certain levels of innovativeness. (Source: Girma, S., Gong, Y., Gorg, H., & Yu, Z. (2009). Can production subsidies explain China’s export performance? Evidence from first-level data. *The Scandinavian Journal of Economics*, Issue 4, 863-891. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9442.2009.01586.x/full>)

²⁴⁸ Note: this system appears grounded in the *Detailed Rules for the Implementation of the Rules for Implementation of the Patent Law*, the revised version of which was issued on January 9th 2010 by the State Council and took effect on February 1, 2010. Specifically, see Part 6, Article 76, 77, and 78 (as well as Article 16 of the *Patent Law*). For an English translation of the measures see: http://www.ccpit-patent.com.cn/references/Implementing_Regulations_Patent_Law_China.htm

The IND-IP-based funding approaches in such types of proposals may raise the types of concerns discussed in the previous IND-IP-based IIPs section.²⁴⁹

Table 13: Example financial incentives for patent development from recent IP proposals reviewed

Province/Municipality	Financial incentives for patent development
Tianjin	<ul style="list-style-type: none"> • <i>From IP Plan issued in 2011:</i> <p>Section 4, Part 6, Article 1: <i>“Improving patent quantity and quality...enacting the ‘Tianjin Implementation Measures on the Ownership and the Bonus and Payment System of Service Invention-Creations.’ Implement the ‘One award, Two remunerations’ system and other relevant regulations. Encourage annual growth rates of enterprise patent applications up to 20%.”</i></p> <p>Section 5, Article 3: <i>“Greatly publicise and recognise the institutions and individuals who contribute outstandingly to the field of intellectual property, strengthening the influence of awards such as the Tianjin Patent Award, Worker Inventor Award, Women Inventor Award, and Juvenile Inventor Award. Setting forth a wide distribution of awards including taking shares in the form of intellectual property rights; accelerating the forming of a new distribution system which will stimulate inventions and the implementation of patent transformation.”</i></p> <p>Section 5, Article 4: <i>“...Strengthen the significance of intellectual property in science and technology awards ...Special funds such as the key technology invention project fund, science and technology invention fund, technology invention fund for technological SMEs, and government financial funds should tilt towards enterprises with indigenous intellectual property rights. ”</i></p>

Source: Author’s selection of articles from provincial/municipal 12th Five Year Intellectual Property Rights Plans and IP Strategies. A non-exhaustive list of other articles from provincial/municipal 12th Five Year IP Plans, IP Strategies, and equivalent/related policies that mention financial incentives for IPR development are listed in the “Chapter 3” section in the Annex. Translations are from the European Chamber thus are unofficial.

Additionally, while not necessarily overtly concerning, *per se*, there are a range of incentives, including but not limited to financial incentives, often offered at the municipal and local levels to spur inventions, directly and indirectly intended to encourage patent applications, the usefulness and workings of which deserve further investigation with their implementing authorities. For example, according to regulations like the *2012 Grading Policy for Non-Shanghai College Graduates of Obtaining Employment in Shanghai*, issued in May 2012 during the Joint Meeting on the Employment of Shanghai College Graduates, students and workers who file patents are more likely to earn a *hukou*, a Chinese residence permit which restricts workers from moving to cities they are not originally from.²⁵⁰ Sources find that professors who own patents are more likely to win tenure.²⁵¹ Applicants to research universities and institutes are given preference in admission if they file more patents.²⁵² Companies with patents are more likely to win big government contracts.²⁵³

²⁴⁹ Note: While the Tianjin 12th Five Year IP Plan does not explicitly define the term “indigenous intellectual property rights,” this term is defined by the Tianjin IPO (see Box 5).

²⁵⁰ Under the measure, there is a standard score for non-Shanghai college graduates, whereas if the score of the graduate has surpassed the standard score the graduate can apply for a Shanghai *hukou*, and if the score does not surpass the standard score the graduate can only apply for a “Shanghai Residence Permit for Talents.” The measure sets forth the following criteria within this scoring system: Section 2, Part 4: *“Has an invention patent certificate: 5 points; has a utility model patent certificate: 1 point; has a design patent certificate: 1 point; has a design patent certificate and is employed by a unit in the creative design industry: 3 points.”*

²⁵¹ Innovation in China: Patents, yes; ideas, maybe. (2010, October 14). *The Economist*. Retrieved from

<http://www.economist.com/node/17257940>

²⁵² Gao et al. (2011), p. 87

Governments offer individual patent filers incentives such as housing support,²⁵⁴ and provincial/municipal governments may offer land and rental subsidies for certain companies in “innovative” industries.²⁵⁵ According to national-level law, prisoners, even those with life sentences, can commute their sentences if they produce “inventions or major technological renovations” and there is evidence sub-central levels have created implementing measures for this allowance.²⁵⁶

Without a comprehensive assessment on how all financial incentives of all provinces/municipalities in China are actually implemented and working in practice, if they have even been implemented yet, it is not possible to fully assess if they are most efficiently and effectively using government resources to stimulate patent quality more so than quantity. However, it appears a variety of incentives deserve to be better linked with patent quality metrics in order to be most sustainable, i.e. adopt higher thresholds for which only quality patents are rewarded. It is worth exploring related dynamics herein with the authorities. As a small part of this discussion, it is worth exploring if more sustainable approaches than some of those set out at present might be adopted to make employers offer incentives to their employees to invent not just for the sake of producing patents but to also better contribute to the overall competitiveness of their company, or university or research institute, and China at large.

III.3.1.1.1.5 Large funds from MoST, NSFC, and other S&T-focused bodies

Background

China provides massive government funding for S&T, which in part is used to develop patents. As estimated in McGregor (2010), in 2008 China spent RMB 912 billion on S&T, accounting for 1.54% of GDP that year, whereas 21% of this was from government funding, divided roughly 50-50 among local and central levels; 70% was Chinese “enterprise” money; around 4% was loans from financial institutions; and the remaining expenditures were attributed to several other miscellaneous organisations.²⁵⁷ It appears that from 2000-2006 61-73% of all government funding for science and technology was given to manufacturers of communication equipment, electronic equipment, transport equipment (including aerospace), and machinery (general purpose, special purpose and electrical).²⁵⁸

²⁵³ The Economist (2010)

²⁵⁴ Lohr, S. (2011, January 1). When innovation, too, is made in China. *New York Times*. Retrieved from http://www.nytimes.com/2011/01/02/business/02unboxed.html?_r=2&partner=TOPIXNEWS&ei=5099

²⁵⁵ For example, see Chengdu HTDZ Investing in China – Government Policies. Retrieved from http://www.chengduhitech.co.uk/Guide/Government_Policies.asp

²⁵⁶ This allowance is grounded in Article 78, para. 1 of *Criminal Law of the P.R.C* which states “A criminal element who is sentenced to control, criminal detention, fixed-term imprisonment or life imprisonment may have his sentence reduced if, during the period his punishment is being executed, he earnestly observes prison regulations, accepts reform through education, truly repents, or performs meritorious service. The sentence shall be reduced if any of the following meritorious services are performed:(3) making inventions or major technological renovations...For those sentenced to control, criminal detention, or fixed-term imprisonment, the term of the punishment actually to be executed may not, after reductions of sentence, be less than half of the term originally decided; for those sentenced to life imprisonment it may not be less than 10 years.” (emphasis added) As an example of implementation of this provision, the Gansu Prisons Bureau and Gansu Intellectual Property Department issued the *Measures for the Rewards and Recognition of the Invention, Creation and Technical Innovation of Prisoners within the Period of Execution (Trial)* on October 1st, 2009 (Source: news article on measure, although a copy of the actual measure could not be readily located, retrieved from http://www.sipo.gov.cn/mtjj/2009/200908/t20090803_471159.html)

²⁵⁷ McGregor, J. (2010). *China’s drive for ‘indigenous innovation’: A web of industrial policies*. US Chamber of Commerce; APCC Worldwide. p 17 and Annex 2, p. 44. Retrieved from http://www.uschamber.com/sites/default/files/reports/100728chinareport_0.pdf

²⁵⁸ Calculations using data from the *2004-2009 China Statistical Yearbook*, *2007 China Statistical Yearbook on High Technology Industry*, and *2000-2007 China Statistical Yearbook on Science & Technology*. Note: “Government Funds” refer

A range of financial support that makes-up China's public S&T funding overall appears, while there are exceptions, to be quite closed to foreign participation. Key S&T development programs overseen by MoST include the Key Technologies Program, 863 Program, 973 Program, Torch Program, and National Key Laboratories program. There are a variety of MoST spin-off programs from these programs.²⁵⁹ The National Natural Science Foundation of China (NSFC), Chinese Academy of Sciences (CAS), and China Scholarship Council (CSC) all also have funding programs for research collaboration.²⁶⁰ Sources suggest most of these programs are in fact not open to foreign participation and have largely not been utilised much by foreign enterprises.²⁶¹

Issues with distribution requirements for such funding

In some cases the aforementioned programs appear to be linked to patent-based criteria, which may be difficult for foreign entities (individuals, research institutes, or enterprises) to meet and which may not best stimulate quality patents and related innovation from any nationality of entity. For example, the Innovation Fund for Small Technology-based Firms ("Innofund") is a main component of the Torch Program, and is linked to IND-IP-based requirements²⁶² and is also contingent on an entity qualifying under the HNTE scheme,²⁶³ raising the concerns over these requirements as mentioned in the next section on HNTE status. By way of another example, the 973 program's official government website indicates the program emphasises building "original innovations and indigenous intellectual properties in China's research."²⁶⁴

to those "obtained from government agencies at all levels to be used for S&T activities, including funds for scientific undertakings, funds for capital construction and scientific research, science fund, funds from education expenditures by education departments for S&T activities, and extra-budgetary funds from government agencies for S&T activities." And "Science and Technology Activities" refers to "organised activities in the fields of natural sciences, agricultural science, medical science, engineering and technological sciences, humanities and social sciences, aimed to generate, develop and disseminate knowledge and technology. These activities can be divided into R&D, its subsequent outcome and application." (Source: 2009 China Statistical Yearbook)

²⁵⁹ For one resource on national funding programs see: ChinaAccess4EU National Funding Programs in Mainland China, retrieved from <http://www.access4eu.com/China/274.php>. Also for some information on provincial/municipal plans see NSD Bio Group. (2009). *Research report on Chinese high-tech industries*. US China Economic and Security Review Commission. Retrieved from http://www.uscc.gov/researchpapers/2009/Research_Report_on_Chinese_High_Tech_Industries.pdf

²⁶⁰ Note: much of the funding from these entities is not given to private enterprises, whether Chinese or foreign.

²⁶¹ 2012, March 6- Consultations with several R&D managers of large multinational companies involved in the European Chamber suggest they have not tapped into these funds. Discussions with the Chamber's R&D Forum Chairs and Shanghai government authorities on May 17th 2012 suggest that foreign companies find ways of working effectively with Chinese universities and research institutes, and thus can sometimes access such funding through those cooperation activities. However, foreign companies typically find it very difficult to cooperate with Chinese enterprises – particularly SMEs – on S&T projects, and thus are not able to use that form of cooperation to access government S&T funding. Consultations with members of different working groups of the European Chamber on June 27th 2012 also confirm these findings.

²⁶² Notes: The Innofund is one of the main components of the Torch Program, and the fund provides financial grants in the forms of interest-subsidised loans and equity investment, among other subsidies. The Innofund is aimed at supporting technology innovation activities of small technology-based firms, facilitating transfer of research achievements, nurturing certain small technology-based firms and expediting the industrialisation of "new and high technology" enterprises. (For more information on this fund in English see: <http://168.160.200.181/eng/eiym/MainContents.htm>.) Article 6 of the *Regulations on the Innovation Fund for Small Technology-based Firms (Provisional)*, issued by MoST and MoF on May 21st 1999, which is still effective, states that indigenous intellectual property will be a core component in providing prioritised funding from the Innofund. This is the only place where intellectual property was mentioned in this Innofund measure. (Retrieved from http://www.innofund.gov.cn/innofile/se_02.asp.) Also see information on the Torch Hi-tech Industry Development Center of MoST at <http://www.chinatorch.gov.cn/index.html> and Recognition of Hi-tech Enterprises at [http://www.innocom.gov.cn/web/\(http://www.innocom.gov.cn/web/static/articles/catalog_3/2009-07-28/article_2820410421c5bfc50121c7e174b90054/2820410421c5bfc50121c7e174b90054.html](http://www.innocom.gov.cn/web/(http://www.innocom.gov.cn/web/static/articles/catalog_3/2009-07-28/article_2820410421c5bfc50121c7e174b90054/2820410421c5bfc50121c7e174b90054.html)

²⁶³ See *Notice Regarding Lists of Companies Recognised as Key High-and-New Technology Enterprises (HNTEs) of the National Torch Program in 2010 issued on December 8th 2010* (effective till 2013), retrieved from http://www.innocom.gov.cn/web/static/articles/catalog_2/2010-12-09/article_282041042cb0ab79012ccaa9706c000f/282041042cb0ab79012ccaa9706c000f.html

²⁶⁴ The Implementation Results of the 973 Program, retrieved from <http://www.973.gov.cn/English/Index.aspx>

There are a number of other restrictions on Chinese government-funded S&T projects that in some cases lessen the effectiveness of such projects' ability to build quality patents. Article 20 of the *Law on Scientific and Technological Progress*, amendments on which were effective as of January 2008, plainly stipulates the Chinese government must own technology resulting from research partnerships that tap into government S&T funds and are relevant to "national interests," a concept distinguished from national security and public interests.²⁶⁵ Sources suggest that government approval is required before one can exclusively license IPR resulting from government-funded S&T projects to foreign entities. Further, there is concern that money or other support from SOEs or universities used to fund research projects may also be considered in certain circumstances as "government funding" and thus be subject to the aforementioned restrictions.²⁶⁶ While some of the aforementioned requirements may be grounded in good-intentioned policy rationales, they are arguably overly broad and thus create regulatory/business planning uncertainties, business transaction costs, and, generally, somewhat worsen the perception of the IPR protection environment in China.

In contrast, under the EC's rules for funding research and technological development and demonstration, project partners are entitled to own the knowledge produced from the projects. Beyond this, it is only required that the project partners reach an agreement among themselves on IP ownership and licensing, whereas IP ownership transfer and licensing is explicitly allowed under the EC rules.²⁶⁷ This difference of treatment in research and technological development programs in the EU vs. China appears to be in conflict with several provisions in the *Agreement for Scientific and Technological Cooperation Between the European Community and the Government of the People's Republic of China*.²⁶⁸ Generally, the aforementioned restrictions likely to some degree explain why many foreign enterprises and perhaps a range of domestic enterprises are not utilising the Chinese programs more, and thus why such programs are in some ways not as efficient and effective in contributing to development of quality patents and related innovation in China as they might be without such restrictions.

Several other concerns likely further explain why China's S&T technology funding programs are not most efficiently or effectively contributing to the development of quality patents. Some sources suggest that if an R&D partner (e.g. a university) is not just working on a service invention but

²⁶⁵ Text of Article 20: "With respect to the invention patent, computer software copyright, exclusive right to layout design of integrated circuits and new variety right of plants that is formed through a project supported by the science and technology foundation or the science and technology program sponsored by treasury money, the project undertaker may obtain relevant intellectual property rights except those concerning national security, national interests or important public interests. [para.2] The project undertaker shall implement the intellectual property rights stipulated in the preceding paragraph according to law, simultaneously adopt protective measures, and submit an annual report on implementing and protecting relevant intellectual property rights to the department in charge of the project; if the project undertaker fails to implement intellectual property rights, the state may implement them free of charge or may license others to implement them with charge or free of charge. [para.3] With respect to the intellectual property rights obtained by the project undertaker according to Paragraph 1 of this Article, for the purpose of national security, national interests or important public interests, the state may implement them free of charge or license others to implement them with charge or free of charge..." (emphasis added). For one English translation of the amended law see: http://www.china.org.cn/china/LegislationsForm2001-2010/2011-02/11/content_21899295.htm.

²⁶⁶ Wang, B. (2012, February 13-14). *Working with Chinese Universities – IP issues in agreements*. [Presentation]. 3rd Advanced China IP Counsel Forum, Shanghai; and Lutze, O., Wang, B., Xu, C., & Carnabuci, C. (2012, February 13-14). *Collaborative research with Chinese Universities: How to create a win-win working relationship*. [panel discussion]. 3rd Advanced China IP Counsel Forum, Shanghai

²⁶⁷ European Commission [EC]. *Guide to intellectual property rules for FP7 projects* (Version 3). Retrieved from ftp://ftp.cordis.europa.eu/pub/fp7/docs/ipr_en.pdf

²⁶⁸ For example, see Article 3 (b) "reciprocal access to the activities of research and technological development undertaken by each Party"; and Annex: Intellectual Property Rights -- Part II, Article 3 (c) "non-discriminatory treatment of participants from the other Party as compared with the treatment given to its own participants." (Source: Agreement as published in the Official Journal of the European Communities on January 11th 2000, retrieved from <http://ec.europa.eu/world/agreements/downloadFile.do?fullText=yes&treatyTransId=784>)

performing other technological inventing, it can be difficult for one's company to enjoy exclusivity on the resulting invention(s).²⁶⁹ Collectively, this and the aforementioned restrictions, help explain why China's government-funded S&T programs are in some ways not as efficient and effective in contributing to development of quality patents as they might be without such restrictions. This is compounded by a variety of other factors, for example difficulties companies face when navigating partner university/research institutions' internal restrictions on profit-sharing and IP ownership and licensing agreements with external partners; and ensuring that the appropriate entities are identified that can legitimately sign a contract on behalf of the university/research institute targeted; and lack of visible and condensed information in European languages on all China's state-funded S&T programs.²⁷⁰

Lastly, and more generally, some sources find that China's S&T system has overly prioritised commercialisation in a way that hurts development of basic research and research otherwise chiefly intended for the public good, which in turn hampers the development of quality patents. Chen and Kenney (2007) and Zhong and Yang (2007) find that application-oriented research institutes in China have benefitted most from changes in China's innovation policy, whereas those engaged in basic research find it far more difficult to obtain government funding and attract top-level researchers.²⁷¹

Some recent revisions to the system?

It is worth noting that some recent policy statements, in particular the *2012 National IP Strategy*, appear to at least realise China's current S&T funding system needs more reform, although it remains to be seen how these policies will be implemented in a way that better stimulates innovation and patent quality. In particular, provisions of relevance herein include Part 6, measure 58 from SIPO on pilot assessments for IP in major S&T activities; Part 6, measure 60 from MoST on formulating specific regulations on IP management in major S&T projects; Part 6, measure 61 from MoST on reviewing and improving measures on managing IP in national S&T projects; and Part 6, measure 64 from MoST, MIIT, and SIPO for improving supervision, assessment and guidance on major S&T projects. It remains to be discussed with the authorities if some reforms to S&T funding systems proposed in Part 1, measure 1 and 2 of the *2012 National IP Strategy* link obtainment of IP rights and indigenous innovation preferences together. (See the "Introduction" section in the Annex for full text of provisions.)

III.3.1.1.1.6 HNTE status

The High and New Technology Enterprise (HNTE) status scheme is perhaps the most controversial set of tax rules also directly related to patent-quality issues. Under the HNTE scheme, qualifying enterprises pay a mere 15% tax rate (a 10% saving given the otherwise 25% Enterprise Income Tax [EIT] rate), receive a 150% 'super' deduction for R&D expenses, and a potential business tax (BT) deduction.²⁷² The *Administrative Measures for the Recognition of Hi-tech Enterprises*²⁷³ and the Key

²⁶⁹ Wang (2012); and Lutze et al. (2012)

²⁷⁰ As well as a lack of awareness of the programs, although certain projects, such as ChinaAccess4EU provide helpful information on a variety of these plans.

²⁷¹ Chen, K., & Kenney, M. (2007). Universities/research institutes and regional innovation systems: the cases of Beijing and Shenzhen. *World Development*, Vol. 35, 1056-74. Retrieved from <http://www.mendeley.com/research/universitiesresearch-institutes-and-regional-innovation-systems-the-cases-of-beijing-and-shenzhen/>; Zhong, X., & Yang, X. (2007). Science and technology policy reform and its impact on China's national innovation system. *Technology in Society*, Vol. 29, 317-25.

²⁷² Chan and Liu (2012). Also, it is worth noting there are tax preferences under the Technically Advanced Service Enterprises (TASE) status scheme, whereas those qualifying receive a 10% reduction on the EIT, up to 8% deduction on taxable income instead of the normal 2.5% allowance, and can carry forward unused deductions.

²⁷³ Retrieved from http://www.gov.cn/zwggk/2008-04/24/content_953215.htm

High-tech Fields With State Support, both issued on April 14th 2008 by MoST, MoF, and SAT²⁷⁴ along with the *Working Guidance on the Recognition of Hi-tech Enterprises*, from MoST, MoF, and SAT promulgated on July 8th 2008,²⁷⁵ controversially define high-tech enterprises in need of key support as referred to in Article 28 of the *Enterprise Income Tax Law of the People's Republic of China* (hereafter the "EIT Law"). Specifically, Part V, Section I, para. 4 of the Appendix to the *Working Guidance on the Recognition of Hi-tech Enterprises* (the "HNTE Guidance") stipulates qualifying enterprises must own "core" IP in China or have "worldwide rights to the exclusive use" of IP for five or more years.²⁷⁶ The guidance explicitly states that "No enterprise that does not have any independently developed core intellectual property will be recognised as a high-tech enterprise."²⁷⁷ Further, the HNTE Guidance and application form therein stipulates that on a 100 point scale for assessing enterprises for HNTE status, IP is worth 30 points with a minimum score of 70 needed.²⁷⁸ These provisions on IP ownership and restricted licensing are overly burdensome.

The HNTE regime may discourage patent development in China by denying foreign firms access to financial incentives on the basis of rational business decision-making. Foreign companies may prefer to license technology from abroad, and not only provide exclusive worldwide licenses, instead of transferring it via full-on ownership transfer agreements or exclusive worldwide licensing agreements. As such, the HNTE scheme requirements may in effect limit the ability of operations of foreign enterprises to produce quality patents that could ultimately spillover into benefiting China and further encouraging Chinese innovation and patents given they are denied access to financial incentives on the basis of rational business decision-making.

Further, in practice, these clearly restrictive IP-related conditions are even more restrictive. Specifically, as also mentioned in the IND IP section, while "worldwide rights to exclusive use" is stipulated in the measures as a substitute for ownership of IP, this exception cannot be practically met because current Chinese law effectively prohibits an owner/licensor from retaining IP usage rights in a foreign jurisdiction and also prohibits any other person, including a subsidiary of an HNTE, from receiving a sublicense from the China licensee.²⁷⁹ This has led some, for example Deloitte (2008), to conclude it will be difficult for most China affiliates of multinational companies to obtain HNTE status.²⁸⁰

²⁷⁴ Retrieved from http://www.wjkc.gov.cn/E_ReadNews.asp?NewsID=485

²⁷⁵ Retrieved from http://www.most.gov.cn/gxjscyfq/wj/200810/t20081029_64626.htm

²⁷⁶ Part V, Section I, para. 4: (i) *Independently developed core intellectual property*: "The term 'exclusive license' as used in the Working Guidance means the licensee enjoys the worldwide rights to the exclusive use of the intellectual property (patents, software copyrights, proprietary rights to integrated circuit layout designs, new varieties of plants, and other rights) stipulated in the agreement for five years or more, during which period neither the licensor nor any third party shall be entitled to use such intellectual property. (ii) *Independently developed core intellectual property as referred to in the recognition of high-tech enterprises shall be owned rights registered within the territory of China, or shall represent an entitlement to an exclusive worldwide license for five years or more (the term for the relevant high-tech enterprise shall fall within the period of five or more years for which the exclusive license remains effective) and be within the period protected by Chinese law.*" (emphasis added)

Also, the Application for Recognition of Hi-tech Enterprises (in Annex 2 of the Appendix to the HNTE Guidance) clearly includes indigenous innovation-type definitions in its instructions for determining what constitutes high-tech enterprises: See Article 7: "The term 'technology source' refers to enterprises' self-owned technology, other enterprises' technology, central science and research institutes, local science and research institutes, colleges and universities, and enterprises' innovation of imported technology and foreign technology." (emphasis added)

²⁷⁷ (Appendix) Part VI, Section (II), Article 1, Note 5

²⁷⁸ See Chart in (Appendix) Part VI, and the "Form for expert evaluation in order to be a high-tech enterprise" in the Application for Recognition of Hi-tech Enterprises in Annex 4 of the Appendix to the HNTE Guidance

²⁷⁹ See Orrick Tax Law Update (2010)

²⁸⁰ Deloitte. (2008). *China tax law commentary*. Retrieved from http://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Documents/us_csg_chinataxlawcommentary_0808.pdf

Moreover, according to Part V, Section I, para. 1 of the Application for Recognition of Hi-tech Enterprises (in Annex 2 of the *HNTE Guidance*), utility models and design patents (and other types of IPR) can be used to meet the IPR requirements of HNTE status, which appear to overly encourage filing of these patents.²⁸¹ There are certain restrictions on the aforementioned types of IPR in achieving HNTE status, and criterion in the Application Form in Annex 4 of the *HNTE Guidance* has been found to say that six non-invention patents (e.g. utility model patents) constitute one invention patent for the purposes of applying for HNTE status.²⁸² However, the effectiveness of these criteria and the actual vetting process to ensure highest quality patents are used to apply for the HNTE program is dubious, as there is evidence that the system, while perhaps to some degree building quality patents, still favours less-than-highest-quality patents. For example, Chinese government consultations suggest that many enterprises simply use utility models instead of invention patents the purposes of applying for HNTE status.²⁸³ As such, the HNTE scheme at present very well may encourage filings of less-than-highest quality patents, whereas if reformed it could better stimulate highest-quality patents and related innovation.

III.3.1.1.2 Standardisation policies

Discriminatory standard-making procedures, withholding information on standards, and discriminatory *de jure* standards and *de facto* application of standards have long been used to promote Chinese innovation; however, these initiatives stifle competition, potentially denying the Chinese market certain quality patents and sharing of know-how from foreign and domestic firms. Some key examples of these policies are listed below:

- **Restrictions on standard-making exclude enterprises from patent pools:** Foreign-invested enterprises (FIEs) often do not have access to the Technical Committees in which standardisation is decided, and therefore cannot join patent pools.²⁸⁴
- **Information restrictions on patent-related requirements needed for implementing standards:** For example, FIEs are unable to obtain information on the scope and requirements of patents to implement the standards which are frequently used in mandatory certification schemes.²⁸⁵
- **Intentionally developing national standards based only on the capabilities of Chinese SOEs:** By way of example from the ICT sector, specifically in the value-added telecoms and information security industries, standardisation is frequently and increasingly being used to promote patented Chinese technologies by developing national standards exclusively reflecting the capabilities of SOEs and certain private Chinese companies.²⁸⁶
- **Refusal of certain Chinese entities to license “essential patents”:** Further on this particular point is discussed below.

²⁸¹ (Appendix) Part V (“Other significant indices”), Section 1, para 1: “Independently developed core intellectual property as referred to in the Recognition Measures includes inventions, utility models, designs in which the pattern and shape of a product is changed in a non-simple manner (which generally means designs generated by the application of scientific and engineering technology in the course of research and development), software copyrights, proprietary rights to integrated circuit layout designs and new varieties of plants.” (emphasis added)

²⁸² See category 1 in the “Form for expert evaluation in order to be a high-tech enterprise” in the Application for Recognition of Hi-tech Enterprises in Annex 4 of the Appendix to the *HNTE Guidance*.

²⁸³ 2011, October 28- Meeting with SIPO Commissioner Tian Lipu, other senior SIPO officials, and European Chamber representatives.

²⁸⁴ European Chamber. (2012, 1 March). Internal document re March 5th meeting with the EC on “Prospects for the Service Sector in China.”

²⁸⁵ Ibid

²⁸⁶ Ibid

- **Direct competitors have unnecessary access to IP submitted in application documents for chemical projects:** The approval process for a chemical project in China above \$300 million USD and also certain other projects involves local experts to evaluate the project and advise on its oversight. Expert selection is not transparent, whereas direct competitors of an applicant are often requested to join the advisory panel, thereby gaining access to confidential and proprietary information submitted in application documents. Compounding this is the fact that the high level of detail required in the process is well beyond the information released during a similar process in OECD countries.²⁸⁷ As such, it is not uncommon in this process that there is leakage of trade secrets and sometimes patented information to Chinese competitors who employ or have close relations with those experts on the aforementioned panels.²⁸⁸
- **Direct competitors have unnecessary access to IP submitted for approval of pharmaceuticals, and can delay approval of pharmaceuticals:** Direct competitors of a firm applying for approval of a pharmaceutical sit on the State Food and Drug Administration (SFDA)'s approval panel for that pharmaceutical. These competitors thus have access to the wide range of IP-related information required to be submitted as part of the approval process, which raises obvious concerns about IP leakage. Additionally, it is reported that these direct competitors leverage their positions on the panel to delay approval of a pharmaceutical while they themselves push a similar or the same pharmaceutical through the approval process.²⁸⁹
- **IP leakage during CCC Mark accreditation:** China Compulsory Certification (CCC) Mark accreditation is a safety certification program covering a variety of product categories that is mandatory for such products to be sold in China. For years, foreign industry, particularly software encryption companies, have been required to disclose IP source codes in order to be granted a CCC Mark.²⁹⁰ Although certain CCC Mark-related rules have been revised in recent years, for example in 2009, concerns persist over proprietary IPR leakage due to the fact that the changes still do not adequately reform the system.²⁹¹
- **Domestic IP requirements in the MLPS:** A variety of sources identify the Multi-Level Protection Scheme (MLPS) as problematic in that it includes domestic IP requirements that do not allow foreign companies to build a variety of Chinese infrastructure, whether as part of government procurement or commercial initiatives.²⁹² In a related vein, sources complain that certain commercial encryption regulations do not allow foreign vendors to sell, produce or carry out R&D on encryption-related technology in China.²⁹³

²⁸⁷ European Chamber (2012, forthcoming). 2012/2013 Petrochemical, Chemical, and Refining (PCR) Working Group Position Paper.

²⁸⁸ 2012, May 9- Consultations with several members of the European Chamber

²⁸⁹ 2012, July 14- Consultations with a member of the European Chamber in Shanghai

²⁹⁰ Linton et al. (2010) pp 4-13, 5-14, 5-17

²⁹¹ Hammer, A. et al. (2011). *China: Effects of intellectual property infringement and indigenous innovation policies on the US Economy*. USITC Investigation No. 332-519, pp 5-29. Retrieved from <http://www.usitc.gov/publications/332/pub4226.pdf>

²⁹² Among others see: Neuffer, J. (2011, June). *Statement of John Neuffer on China's Five-Year Plan, indigenous innovation and technology transfers and outsourcing*. Hearing before the US-China Economic and Security Review Commission, pp. 78-79. Retrieved from

http://www.uscc.gov/hearings/2011hearings/transcripts/11_06_15_trans/11_06_15_final_transcript.pdf; also see Wolf, A. (2011, May). Alan Wolff's testimony on "China's Indigenous Innovation Policy". Hearing before the US-China Economic and Security Review Commission. Retrieved from

http://www.uscc.gov/hearings/2011hearings/written_testimonies/11_05_04_wrt/11_05_04_wolf_testimony.pdf

²⁹³ Hammer (2011)

- **Potentially disconcerting requirements involving TCM chips:** China has developed its own Trusted Cryptography Module (TCM), a chip in computers to control security functions, and some worryingly suggest these may be required in products in China.²⁹⁴

At large, the aforementioned approaches to Chinese standards impact patent quality by excluding many foreign and even Chinese companies that may or could be competitive in industries relying on related standards. The policies deny the market know-how, patents, and related innovations that would have been otherwise diffused or newly developed without such practices.

Worse, the aforementioned approaches to Chinese standardisation may actively encourage initiatives that will ultimately fail domestically and/or fail during international expansion attempts, thus wasting resources, whereas this might have been avoided if standards were subject to more transparency and fuller consultation and otherwise more inclusive development. For example, this phenomenon clearly played out in the often cited case of China's WLAN Authentication and Privacy Infrastructure (WAPI).²⁹⁵

While there are inferably security and economic rationales for the aforementioned standardisation policies, these need not justify the level of discrimination in the policies that ultimately hinders developing quality patents and related innovation in China. On one hand, to some extent, reasonable Chinese security rationales underlie certain standards like the MLPS. Also, there are economic rationales that the aforementioned standards are needed to limit license fees paid to developers of international standards, provide an avenue for Chinese firms to earn IP-related revenues for making their own products and processes, among the other rationales mentioned in Box 6 in the IND-IP-based IIPs section. However, on the other hand, it could be argued that these similar objectives can be achieved, and in fact achieved more sustainably, through less discriminatory policies.

Unwillingness of certain Chinese entities to license “essential patents”

Further to the above discussion, it is important to note that China is increasingly seeking to develop what are often termed “essential” patents: patents containing one or more claims that are critical to the implementation of a technical specification or standard.²⁹⁶ For context, amongst members of standards-development/setting organisations (“SDOs” or “SSOs”), for example the European Telecommunication Standards Institute (ETSI), an owner of essential patents containing one or more claims that are essential to the implementation of a technical specification or standard should declare this relation and provide licenses on “fair, reasonable, and non-discriminatory” (FRAND) conditions and terms, subject that the beneficiary also provides reciprocal access on essential patents he/she owns.²⁹⁷ Similarly, China has regulations stipulating that owners of essential patents should report if their patents are part of standard-setting or if their patents are otherwise involved in standards being developed; and such patents are required to either be licensed free-of-charge or below normal royalty rates.²⁹⁸

²⁹⁴ Wolff (2011), p. 18

²⁹⁵ Although a variety of issues outside transparency in its creation also led to WAPI's failure in being recognised as an international standard.

²⁹⁶ Note the patents referred to herein are not necessarily only of the three types of patents granted in China. Also note that “essential patent” may be used in different contexts to, for example, referring to the general commercial competitiveness of the patent.

²⁹⁷ Amar, C., & Puech, J. (2009, July 1). Licensing essential patents in the telecoms industry. *Managing Intellectual Property Magazine*. Retrieved from <http://www.managingip.com/Article/2251048/Licensing-essential-patents-in-the-telecoms-industry.html>

²⁹⁸ See the *Standardisation Administration of the People's Republic of China's 2009 Regulations on Administration of Formulating and Revising National Standards Involving Patents*

It is sometimes difficult for firms to acquire licenses to essential patents in China, which is a particularly pronounced problem hindering innovation and patent quality in industries with patent thickets. "Patent thickets," the inter-relation between patents across of number of areas (e.g. among telecoms, semiconductors, and computing) are particularly prevalent in certain industries, for example the ICT industry, where implementation of even a single standard may require licenses of dozens or even hundreds of patents owned by multiple licensors.²⁹⁹ Despite a regulatory framework in place for licensing essential patents in China, in practice there are sometimes difficulties in accessing these patents. For example, European IP holders have continued to experience great difficulties in engaging the Chinese telecommunications industry in licensing discussions, while the latter has even made a coordinated effort recently to jointly delay or deny such discussions.³⁰⁰ Access to essential patents is critical in order for firms to operate in certain industries, particularly in those with patent thickets, and difficulties in accessing such patents hinder competition which can hamper development of quality patents and related innovation.

On a related issue, there is an increasing acquisition of patents in China through non-practicing entities (NPEs), which in part means more standards will be owned by entities motivated only by the desire to monetise acquired patents.³⁰¹ Improved Chinese regulation of NPEs may be needed to keep this concerning trend in check. These trends in some ways create an environment that alienates innovative firms, and therein can hamper China's initiatives to build quality standards and patents.

International standard-building regulations with IND IP requirements and subsidy components

There are Chinese measures in place that encourage standardisation via potentially concerning IND-IP-based requirements linked to significant subsidies. For example, the *Beijing Administrative Measures of the Special Subsidiary Funds for the Formulation (Revision) of Technology Standards*, issued on November 13th 2006, by the Beijing MoF and Beijing Municipal Bureau of Quality and Technical Supervision, which still appears to be effective, states:

Section 3, Article 6: "Article 6 allowance programs should be qualified for one of the following conditions...6.2 in line with Beijing key industries development; 6.3 taking advantages of advanced research results; 6.4 possessing indigenous intellectual property, beneficial for the forming of competitive industries and striving for the top within industry..."

Article 7: According to the innovation level of the standard initiative, individual subsidy awards for qualified standard projects are as follows:...

(6) Significant standard initiatives of great significance that are authorised and published could surpass the subsidies stipulated in Article 7.1-5 to be subsidised up to 1 million Yuan."³⁰²

²⁹⁹ European Chamber. (2011). 2011/2012 Intellectual Property Rights (IPR) Working Group Position Paper, p. 41.

³⁰⁰ 2012, May 14- Consultations with a representative in the telecom industry in the Chamber's IPR Working Group

³⁰¹ European Chamber. (2011). 2011/2012 Standards and Conformity Assessment (SCA) Working Group Position Paper, 84-85.

³⁰² Retrieved on June 15, 2012 <http://www.bjtsb.gov.cn/infoview.asp?ViewID=2711> Notes: Translation is from the European Chamber thus is unofficial. There is no definition of the term "indigenous intellectual property" in the measure itself. Article 7.1-5 reads: "(1) Authorised and published in-line with international standards: a subsidy of no more than 500,000 Yuan; (2) Authorised and published in line with national standards: a subsidy no more than RMB 300,000 Yuan; (3) Authorised and published in line with industrial standards: a subsidy no more than 200,000 Yuan; (4) Authorised and published in line with local standards: a subsidy no more than 200,000 Yuan; (5) An enterprise's indigenously innovative technology which is approved in line with international, national, industrial and local standards: a special subsidy no more than 150,000 Yuan." Note 3: Article 6.5 also applies the following conditions: "Through adopting, absorbing and transforming international standards or foreign advanced standards; meanwhile improving technology and re-innovating, and then establishing new international, state, industrial and local standards..."

The aforementioned measure may unintentionally drag down patent quality for the same reasons mentioned in the earlier section on standards, and the severity of this drag is compounded by the measure's link to subsidies. The IND IP requirement as linked with subsidies, while indeed perhaps a useful way to encourage domestic enterprises' unilateral development of standards, ultimately may limit the quality of the standards produced through an otherwise more competitive funding process. Also, for other reasons similar to those mentioned in the IND-IP-based IIPs discussion earlier in this Chapter, this approach can have a negative impact on patent quality and related innovation.

III.3.1.1.2.1 Raw deals involving patent ownership in closed sectors

Sources suggest that in closed sectors (often *de facto* rather than *de jure* closed) where the only way of entry is through JVs with Chinese companies that dominate therein (usually SOEs), these dominant companies may leverage low quality patent portfolios in creating what is termed hereafter 'raw deals.' For example, Chinese firms may leverage patent portfolios of dubious quality to get a better financial deal via demanding royalties while using their superior negotiating position to block due diligence on the contents of these patents.³⁰³ In the worst case scenario, the portfolio might be significantly composed of low-quality patents.

This phenomenon is compounded by "forced" disclosure of know-how in raw deals. Foreign companies find themselves in weak negotiating positions when entering a closed sector, whereas their prospective Chinese JV partner may require they transfer key patented technology as a precondition to entering the JV.³⁰⁴ Also, sources suggest that Chinese partners may, among other tactics, require foreign partners open an R&D centre in China as a precondition for entering a JV.³⁰⁵ Sources suggest that foreign firms, and perhaps private Chinese firms, often enter into these raw deals to win big projects, or in other instances certain authorities may pressure firms into transferring core technology by precluding them from enjoying preferential policies otherwise extended to enterprises engaging in certain business operations. For example, Atkinson (2012) cites an instance where a foreign firm was not allowed to qualify for alternative fuel vehicle purchase subsidies unless it transferred its electric motor, complex electronic controls, or power storage devices to a JV with a Chinese automaker.³⁰⁶

According to some sources, the Chinese public procurement market is hotbed for raw deals involving quality patents. For example, Atkinson (2012) cites an instance where the Chinese government offered market access to a high-speed railway procurement project contingent on exchange for technology transfer, whereas the winning company was required to (ostensibly unreasonably) share its entire know-how and catalogue of technologies with Chinese engineers working on the project. To compound these concerns, sources suggest it is not uncommon for Chinese SOEs, after they acquire foreign technology through such raw deals, to utilise preferential government support to strategically displace foreign firms from the market. Specifically, Chinese firms may displace foreign competitors from the Chinese market via drawing on favorable government regulatory decisions,

³⁰³ Among other sources, see: China's patent strategy worrying foreign firms. (2011, March 22). *The China Post*. Retrieved from <http://www.chinapost.com.tw/china/business/2011/03/22/295534/Chinas-patent.htm>. Note: In some ways, these practices are not necessarily intended to "promote" patents and innovation, but nonetheless can discourage quality patents and innovation.

³⁰⁴ 2012 February 15 - Consultations with several professional services' consultants in Shanghai. Note: supra footnote 303.

³⁰⁵ Atkinson, R. D. (2012, February). *Enough is enough: Confronting Chinese innovation mercantilism*. The Information Technology & Innovation Foundation [IITIF]. Retrieved from <http://www2.itif.org/2012-enough-enough-chinese-mercantilism.pdf>

³⁰⁶ Atkinson (2012), p. 34

and utilising what some alleged to be a depressed currency and other forms of subsidies to strategically displace the same (and other) firms in procurement bids overseas.³⁰⁷

From one perspective, the raw deal approach might look sustainable as it could be argued that the Chinese market is 'just too good to ignore/give-up' for some companies' business operations and thus they must agree to deals they would not have in other less promising markets. Indeed, there are clear examples of some of the most well-known multinational companies capitulating to these raw deals to take advantage of the market.³⁰⁸ After all, one might argue, 'this is business, and this is China.'

However, at large, the raw deal approach does not appear to be a sustainable for building innovation operations which involve patents. Forcing technology transfer has made Chinese firms more reliant on foreign technology. Worse, in the automobile industry for example, it has sometimes even made such Chinese firms lose the independent innovation capacity they may have once had.³⁰⁹ It is possible that the raw deal phenomenon creates a perverse incentive for Chinese companies to continue registering less-than-highest quality patents, and, at worst, low-quality patents. Prevalence of raw deals can make foreign entities in particular less likely to enter the Chinese market at all, pull out of the market, decide against transferring ownership or even licensing quality patents to Chinese entities, invest less in building-up highest-quality patents within JVs than they would have without the raw deals, and so on.

The raw deal phenomenon also may very well increase the perceived urgency to protect techno-economic security in foreign nations as further fanned by the flames of the current economic crisis. This could lead to further closing off and otherwise avoiding technology transfer to China. And some could consider the fact that market access for technology conditions like the type embodied in the aforementioned raw deals appear to be in conflict with WTO commitments in Article 7(3) of China's Protocol of Accession and Paragraph 203 of its Working Party Report³¹⁰ to be an additional argument for supporting stricter techno-economic security policies in response to such deals.

III.3.1.1.3 Ambiguities in technology import and export rules

Rules governing improvements on technology

The *Regulations on Technology Import and Export Administration* (hereafter "TIER"), adopted at the 46th Executive Meeting of the State Council and publicly issued on December 10th 2001 and effective as of January 1st 2002, are discriminatory in requiring subsequent improvements on technological development in a contractual relationship be owned by the party making the improvements. Specifically, Article 27 thereto finds:

³⁰⁷ Atkinson (2012), p. 35

³⁰⁸ For example, see Atkinson (2012), p. 34

³⁰⁹ Testimony of Dan Breznitz (2012), p. 7

³¹⁰ See China's Protocol of Accession, Article 7(3): "...Without prejudice to the relevant provisions of this Protocol, China shall ensure that the distribution of import licences, quotas, tariff-rate quotas, or any other means of approval for importation, the right of importation or investment by national and sub-national authorities, is not conditioned on: whether competing domestic suppliers of such products exist; or performance requirements of any kind, such as local content, offsets, the transfer of technology, export performance or the conduct of research and development in China." (emphasis added). And Paragraph 203 of China's Working Part Report: "...The allocation, permission or rights for importation and investment would not be conditional upon performance requirements set by national or sub-national authorities, or subject to secondary conditions covering, for example, the conduct of research, the provision of offsets or other forms of industrial compensation including specified types or volumes of business opportunities, the use of local inputs or the transfer of technology." (emphasis added)

Article 27: “Within the term of validity of a contract for technology import, an achievement made in improving the technology concerned belongs to the party making the improvement.”³¹¹

The wording of Article 27 of the *TIER* creates notable ambiguity for firms working with others to innovate, particularly foreign firms working with Chinese entities, resulting in a drag on patent quality. As stated in the European Chamber’s forthcoming 2012/2013 IPR Working Group Position Paper, in general, while a licensor shall not restrict the licensee from conducting further research on the licensed technology and acquiring ownership rights on such improvements, Article 27 has been found to be problematic in areas where the licensor is the owner of core technology and has *only* granted the right to use it in a *specific context* of outsourcing R&D activities or toll manufacturing.³¹²

As a side note, while some companies have skirted the requirement in Article 27 with certain provisions in contracts, it is unclear if such contracts are legally valid under that article.³¹³ These regulations create ambiguity for firms innovating with other entities, potentially raising the transaction costs and thus damping the efficiency and effectiveness with which patented products and processes underpinning innovation are ultimately developed in China.³¹⁴

Overly broad definitions of technology import and export

The *TIER* is also unclear as to what technologies are covered under the category of “restricted” technology it sets forth. This makes it notably difficult for companies to assess if the imported/exported technology falls into the category, making international companies hesitate to import certain technology into China.³¹⁵

Moreover, it is unclear what technologies are covered under the category of “prohibited” technology in the *TIER*, as their listing in the measure is not exhaustive and there is in fact a non-published list for “prohibited” products. This becomes particularly problematic when a product is claimed to be on this non-published list, and this is used as justification to not authorise transferring or selling of patents (whereas transferring or selling a patent to a foreigner is considered “export of technology”).³¹⁶ This in turn complicates technology transfer and free usage of patents in a way that hampers innovation and building of patents.

Further, the definition of “technology import and export” as defined in Article 2 of the *TIER* is overly broad, creating uncertainty that may indirectly jeopardise patent quality. It is unclear whether the definition employed in Article 2 covers experimental data at an early stage of research, and thus

³¹¹ See an English translation retrieved from <http://tradeinservices.mofcom.gov.cn/en/local/2007-11-13/9733.shtml>. Note 1: English translations on the title of the *TIER Measures* differ. The Chinese name is *中华人民共和国技术进出口管理条例*. Note 2: These measures are distinct from the *Measures of the Administration of Technology Import and Export Contracts Registration* (技术进出口合同登记管理办法) issued on February 1st 2009 Decree No. 3 [2009] by MOFCOM, retrieved from http://www.fdi.gov.cn/pub/FDI_EN/Laws/law_en_info.jsp?docid=102316, which replaced the *Measures for the Administration of Technology Import and Export Contracts Registration*, called Decree No. 17 (2001) by the Ministry of Foreign Trade and Economic Cooperation (MOFTEC) (中华人民共和国技术进出口合同登记管理办法) issued on December 30th 2001 and effective on January 1st 2002, retrieved from <http://www.lawinfochina.com/Display.aspx?lib=law&Cgid=38067>. Note: These three different measures have incorrect translations on certain websites, and are sometimes incorrectly referenced in secondary sources.

³¹² European Chamber’s 2012/2013 Annual Position Paper: IPR Working Group chapter (2012, forthcoming)

³¹³ 2012, March 16- Consultations with Dr. Oliver Lutze in Shanghai

³¹⁴ Note: While one might speculate that these loopholes in the law were created to in-part mitigate the threat of litigation China’s ‘incremental innovators’ would otherwise face when following IIP guidance for assimilation, absorption, co-innovation and/or re-innovation of foreign technologies, this is unclear.

³¹⁵ 2012, May 7- Consultations with Lin Xu in Shanghai

³¹⁶ 2012, July 14- Consultations with Elliot Papageorgiou in Shanghai

what types of research needs approval from MOFCOM.³¹⁷ As such, entities face uncertainty over how they need to report to the authorities on certain research activities which creates unnecessary transaction costs that somewhat hamper innovation activities and thus the efficiency and effectiveness with which such activities can lead to quality patents. If the restrictions turn-out to be applied to an overly wide range of activities, this would constitute an overly burdensome restriction, likely to some extent discouraging development of quality patents and related innovation.

Overly strict requirements on liability

As noted in the European Chamber's forthcoming 2012/2013 IPR Working Group Position Paper, Article 24 of the *TIER* sets overly burdensome requirements in mandating foreign technology licensors to bear liability for any accusation of infringement that may be brought against the importer in relation to the use of the licensed technology. In areas with patent thickets and where the licensed technology is still not fully developed, such obligation often creates an undue burden on the licensor and makes some technology transfers unacceptable if there is no flexibility to share risks.³¹⁸ This in turn is a drag on patent quality and related innovation in these areas.

III.3.1.1.4 Uncertainty in inventor remuneration rules

There is some uncertainty over legal liability for "reasonable" inventor remuneration in China, which might in the future hamper patent development. As illustrated in the European Chamber's 2011/2012 Position Paper, Chinese regulations require, in the absence of a specific agreement or relevant company policies, "the entity to which the patent is granted" to pay a minimum level of inventor remuneration. Research activities in China are performed by local Chinese companies under contract or by a foreign-invested R&D centre, and the right to apply for patents on solutions developed therein typically belongs to the company providing the investment or those foreign entities who invest in the R&D centre. The concern is thus that a foreign company might be unnecessarily liable for remuneration contracts even if the foreign company actually has no contractual relationship with an employee doing the inventing.³¹⁹ To the extent that this ambiguity could prevent enterprises from signing contracts and investing in certain other parties' R&D operations this is a drag on quality patent development and related innovation in China.

Some measures have recently been proposed to shape the inventor remuneration system in China, although these do not appear to have fully addressed the aforementioned concerns. Provincial/municipal 12th Five Year on Plans on Intellectual Property, for example, Sichuan's and Tianjin's, recognise the need to improve the inventor remuneration system.³²⁰ As a publication of this study, SIPO was conducting "internal" consultations on the *Regulations on the Remuneration for Inventor-Employee's Invention*.³²¹ In general, regulations on inventor remuneration remain unsatisfactorily reformed throughout China.

³¹⁷ 2012, March 15- Consultations with Dr. Oliver Lutze in Shanghai. Article 2: "*The technology import and export as referred to in these Regulations means acts of transferring technology from outside the territory of the People's Republic of China into the territory of the People's Republic of China or visa versa by way of trade, investment, or economic and technical cooperation. The acts mentioned in the preceding paragraph include assignment of the patent right, assignment of the patent application right, licensing for patent exploitation, assignment of technical secrets, technical services and transfer of technology by other means.*"

³¹⁸ 2012/2013 Position Paper of the European Chamber's IPR Working Group (forthcoming, 2012)

³¹⁹ European Chamber Position Paper 2011/2012 (2011), pp 43-44.

³²⁰ Sichuan's 12th Five Year Plan on Intellectual Property, Section 5, Part 3, Article 1: "...*Improve the service invention compensation system.*" Also see Tianjin's 12th Five Year IP Plan, Section 4, Part 6, Article 1.

³²¹ A draft of this measure was provided exclusively to members of the Quality Brand Protection Committee (QBPC) for comment in August 2012. Consultations with two members of QBPC on August 10th 2012 suggest there are concerning provisions in the measure. Consultations with SIPO on August 9th 2012 suggest the measures will be released for public comment at the end of August 2012 or in September 2012.

III.3.1.1.5 Ambiguities in the Measures on Compulsory Licensing

There are a number of ambiguities in the *Measures on Compulsory Licensing*.³²² For example, as listed in European Chamber IPR Working Group (Nov. 2011), the measures could at least be generally more clear about the requirements for granting a compulsory license; could remedy the fact government proposals for a compulsory license do not require evidential support; the patentee's right to request a hearing is restricted, and there are no legal sanctions in cases where a licensee's activities overextend the scope of the granted compulsory license; among other concerns.³²³ Such uncertainties complicate business planning, which can hamper innovation; although in fairness, in practice these regulations do not seem to be applied in an extreme way as of yet.

III.3.1.2 Sub-section 3.2: Less patent-specific, but still patent-related, measures

Introduction: This sub-section investigates how variety of significant Chinese policies and practices that while not necessarily patent-specific do relate closely to patent development and do not necessarily stimulate patent quality and related innovation in China.

III.3.1.2.1 General IIPs that encourage assimilation, absorption, and/or re-innovation

In addition to the IND-IP-specific issues discussed in the former sub-section, China's overarching encouragement of "assimilation, absorption and re-innovation" as a fundamental approach to foreign firms' patented products (and trade secrets, and knowledge otherwise covered under the *Unfair Competition Law*³²⁴) is in some ways concerning. Certain policies herein are concerning even though they do not explicitly set-forth the concepts of indigenous innovation contingent on IND IP or other IPR preconditions like those in the *Trial Measures for the Administration of the Accreditation of National Indigenous Innovation Products* (2006). Example measures used to explain the different dynamics of these IIPs are listed below:

- Part 7, Chapter 27, para. 3 of China's nationwide 12th Five Year Plan, which focuses on efforts to "enhance the original innovation, integrated innovation and the introduction of digestion and absorption of re-innovation..."³²⁵
- Section IV, Part 2 of the NPDS sets forth the following advice: "Encourage enterprises to acquire patent rights through innovation on the basis of digesting and absorbing imported

³²² Draft most recently released for public comments in October 2011. Note 1: Recent procedures rules relating to compulsory licensing came into effect on May 1st 2012 via that *Notice on Patent Compulsory Licensing* issued on March 15th 2012: http://www.sipo.gov.cn/zwgs/ling/201203/t20120319_654876.html (Note 1: link working when last checked on August 1st 2012). Note 2: Mention of compulsory licensing measures was left out of the Executive Summary of this study due to its relatively lesser importance compared with other issues mentioned therein. Note 3: In some ways, these measures are of course not intended to "promote" patents.

³²³ See the European Chamber's IPR Working Group Response to the Call for *Comments on Measures for Compulsory Licensing*, submitted to SIPO on November 13th 2011 (European Chamber IPR Working Group [Nov. 2011]). Measure retrieved from <http://www.sipo.gov.cn/tz/gz/201110/P020111012508894173220.doc>

³²⁴ *Unfair Competition Law of P.R. China*, issued on Sep. 2nd 1993, passed at the 3rd Meeting of 8th National People's Congress Standing Committee, Zhuxi Ling (1993) No.10, retrieved from http://www.saic.gov.cn/fldyfbzdjz/zcfg/fv/200909/t20090928_71369.html

³²⁵ Note: More generally, the term "indigenous innovation" is mentioned throughout the plan, and is reflected in the plan's specific policies to build-up specific sectors.

patented technology.” Part IV, Section 4 of the *NPDS* mentions developing “self-relied” upon innovation and turning this into property rights.

- The *Innovation Promotion Regulations of Guangdong Province* (the “2012 Guangdong Ordinance”), promulgated by the Guangdong People’s Congress Standing Committee on November 30th 2011 and effective on March 1st 2012, “*considering the dilemmas of overly emphasising importing, rather than absorbing and re-innovating,*” supports “*establishing and improving the re-innovation policy.*”³²⁶
- Part 2, Article 3 of *Hunan’s Outline on Constructing an Innovative Province*, effective on March 7th 2012 sets forth the following policy objectives: “*...improve the capability of indigenous innovation as the core for enhancing original innovation, integrated innovation, the introduction of digestion and absorption in re-innovation, and collaboration for innovating...*”³²⁷
- The *Opinions of the Supreme People’s Court on Giving Full Play to the Functional Role of Intellectual Property Trials in Advancing the Great Development and Prosperity of Socialist Culture and Promoting Independent and Coordinated Economic Development* (Fa Fa [2011] No. 18), issued by the Supreme People’s Court (SPC) and effective on December 16th 2011 (hereafter the “*December 16th 2011 SPC Opinion*”) contains the following:

Part 1, para. 1: “*The Central Economic Work Conference requires that we...keep strengthening capabilities of integrated innovation, introduction, digestion, absorption and re-innovation; should comply with the innovation drive and strengthen intellectual property protection; should cultivate and develop strategic emerging industries...*”

Part 3, para. 12: “*...focus on improving China’s original innovation capacity, integrated innovation capacity and capabilities of introduction, digestion, absorption and re-innovation as important goals...intensify the protection of key core technologies, basic and frontier fields, and emerging strategic industries, promote technical breakthrough and technical innovation...*”³²⁸

Approaches to incremental innovation in an economic context

It is first important to recognise that while the simple mention of the terms “assimilation,” “absorption” and “re-innovation” in policies (hereafter, for simplicity, collectively referred to as incremental innovation policies) raise eyebrows in IPR circles, in fact such an approach to innovation has been promoted by a variety of economists for over 20 years. As noted in the Introduction to this study, it is indisputable that incremental innovation, which is based upon exploitation of existing solutions, has solid value.

Within the concept of incremental innovation, one could theoretically distinguish “import-based” incremental innovation from “domestic-based incremental innovation, whereas “import-based” incremental innovation focuses specially on imported foreign technologies rather than on

³²⁶ For a summary of the policymaking process for the measure see Guangdong Provincial People’s Congress News Conference on Promulgation and Implementation of Provincial Independent Innovation Regulation (2010, February 29). Retrieved from http://www.npc.gov.cn/npc/xinwen/dfrd/guangdong/2012-02/29/content_1693676.htm. Regarding text of the measure, see Chapter 2, Article 6, Article 9(1), and Article 10.

³²⁷ Retrieved from http://www.hunan.gov.cn/zwgk/hndt/zwdt/201203/t20120308_457488.htm

³²⁸ *December 16th 2011 SPC Opinion* retrieved from Westlaw China: http://www.westlawchina.com/index_en.html While full of several examples of disconcerting rhetoric, it is worth noting that the *December 16th 2011 SPC Opinion* also contains some provisions that may indirectly have a positive impact on innovation and the IP framework in China.

domestically-created products. An emphasis on incremental innovation based on outside solutions appears to have started with Cohen (1989) and Levinthal (1990), who promoted “absorption,” an awareness of new information and enhanced ability to assimilate and utilise existing information and ideas developed elsewhere to improve one’s own innovation capacity.³²⁹ Other sources find that countries that are able to develop a sufficient absorption capacity are more likely to maximise usage of foreign technologies and may possibly develop their own new technologies.³³⁰

Some sources argue that certain innovation approaches related to incremental innovation have value. Some have suggested that the *shānzhài* (山寨) culture in China, a term referring to the imitation of goods (often electronics in particular), sometimes with small “improvements” on the original product, is in fact an example of incremental innovation that can be a stepping stone towards more substantive innovation.³³¹ As another approach, sources describe “reverse engineering” as a legitimate building block for innovation,³³² which while not tantamount to incremental innovation can be based upon incremental innovation.

There are studies that discuss how IPR protection specifically fits into this system of incremental innovation. As one example, also cited in the Introduction of this study, Lee and Park (2006) explicitly find that the utility model patent system has a positive influence on developing countries’ innovation and growth as it protects incremental inventions and is more conducive to innovation, diffusion of technology, and economic growth in those countries given the make-up of their economic systems.

Why these IIPs have the propensity to hurt patent quality and related innovation in China

While it is important for the government to carefully consider the aforementioned economic logic and find an appropriate balance in IIPs to stimulate innovation and related patent quality, the current IIP framework likely needs reform. The reasons for this are discussed below.

Choosing between current policy thinking when outside-the-box thinking is needed instead

While recognised by economists as important stepping-stones for developing countries to better innovate, it is also clear that an *overly* heavy focus on incremental innovation policies is negative. At worst, an overly heavy focus on import-based incremental innovation policies makes enterprises so reliant on foreign technologies that they become unable to “independently” innovate and develop highest-quality patents in the short-, mid-, and long-term. And this assertion is not clearly challenged by the aforementioned economic literature: in fact certain academic sources, for example Hu and

³²⁹ Cohen, W. M., & Levinthal, D. A. (1989). Innovation and learning: The two faces of R&D. *The Economic Journal*, 99, 569-596; and Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, Special Issue: Technology, Organizations, and Innovation, 35(1), 128-152.

³³⁰ Nelson, R.R. (Ed.) (1993). *National innovation systems: A comparative analysis*. New York: Oxford University Press; Kim, L. (1997). *Imitation to Innovation: The Dynamics of Korea's Technological Learning*. Boston: Harvard Business Press; Yu, T.F.-L. (1998) Adaptive Entrepreneurship and the Economic Development of Hong Kong. *World Development*, 26(5), 897-911; World Bank (2001). *Intellectual property: Balancing incentives with competitive access*. Global Economic Prospects. Washington, D.C.: World Bank, 129-150; and Lall, S. (2003). Indicators of the Relative Importance of IPRs in Developing Countries. *Research Policy*, 32(9), 1657-1680.

³³¹ This phenomenon has received an increasing amount of media attention recently, and its merits are subject of some debate in both China and abroad.

³³² For example, where products developed via reverse innovation in developing countries are sold in developed countries at low prices, creating new markets and uses for the solutions. See: Govindarajan, V., & Trimble, C. (2012). *Reverse innovation: Create far from home, win everywhere*. USA: Harvard Business Press.

Matthews (2008), caution against countries like China getting caught in the trap of being a perpetual imitator rather than evolving to sustain “genuine” innovation.³³³

Also, an overly heavily focus on incremental innovation policies, even if they are focused increasingly or more so on domestic-based incremental innovation than import-based incremental innovation, can be negative as they retard healthy development that may have otherwise happened with a more appropriate balance of policies also encouraging breakthrough innovation. To be sure, this latter assertion need not conflict nor should in any way be negated by recent suggestions in Breznitz and Murphee (2011), that China should not overemphasise policies to build-up “novel-product innovation” (roughly tantamount to the concept of breakthrough innovation used in this study) and that China can support its economy in the next decade or so (mid-term) through “secondary innovation” (roughly tantamount to the concept of incremental innovation used in this study).³³⁴ This said, it is admittedly difficult to decide at exactly which point this overemphasis significantly threatens mid- to long-term innovation, patent quality, and resulting economic development.

In some instances, overemphasis on currently conceived IIPs can indoctrinate the policymaking system in a way that prevents creation and implementation of other domestic Chinese innovation policies that would be more helpful for building up innovation and quality patents realised in the longer-term. By way of illustration, it is clear that some provinces, as illustrated in the abovementioned *2012 Guangdong Ordinance*, are concerned about moving too quickly towards an approach to innovation based too heavily on importing technologies and want to instead *improve their approach* to incremental innovation. As such, it appears that simply recycling existing approaches to innovation will limit Guangdong-based companies’ ability to develop domestically, let alone internationally. While Guangdong is taking action to revise its own problems in this regard, it is worth further investigating if other provincial/municipal authorities across China are ‘trapped’ in deciding among the IIP approaches passed down for further implementation by national authorities or previous provincial authorities to date, whereas they would be better served to think outside this policy box in revising their individual innovation policies.

In summary, in the opinion of this study, while some may debate if China is focusing too much on breakthrough-innovation policies, it is perhaps more exigent to acknowledge that breakthrough innovations are indeed important for the Chinese economy (even if more so in the medium- to long-term) and scrutinise areas where current IIPs should evolve to better foster *both* incremental and breakthrough innovation. None of this should be mistaken as saying the government should necessarily further use more of the types of IIPs currently promulgated to stimulate incremental innovation instead of breakthrough innovation or vice versa; rather, it is to say that there are instances where either or both types of IIPs as currently understood should be revised and better implemented on-the-ground to more effectively meet the ultimate goal they both share: building China into a powerhouse with solid innovation in the future.

³³³ Hu, M. C., & Mathews, J. A. (2008). China's national innovative capacity. *Research Policy*, Volume. 37, 1465-79. Retrieved from <http://nthur.lib.nthu.edu.tw/handle/987654321/61675>

³³⁴ Breznitz, D., & Murphee, M. (2011, May). *Run of the red queen: Government, innovation, globalization, and economic growth in China*. New Haven: Yale University Press. Also see the following quote: “Our fear is that by focusing too much on producing novel-product innovation, the central government will harm a key pillar of China’s sustained economic growth – second-generation production and process innovation. In time, China will come to master novel-product innovation, especially in new industries for which the competitive and standards environment has not yet been defined. But instead of forcing itself to copy foreign models developed within different economic systems, China should follow its own development path. There is no urgency for China to master novel-product innovation, especially since the interdependencies fostered by the fragmented global production system make concerns over national technological security largely irrelevant. China’s position at the heart of global production means that the Run of the Red Queen model of development is secure for the next decade or so.” (Source: Breznitz, D., & Murphee, M. (2011, September). Innovation in emerging economies: China’s run of the red queen. *World Financial Review*. Retrieved from <http://www.worldfinancialreview.com/?p=848>)

Potentially enabling infringement

Even if unintentional, it is not difficult to envisage a situation where Chinese IIPs built on the principles of “assimilation,” “absorption,” and “re-innovation” can encourage infringement given the still underdeveloped respect for IPR in China. Given many consumers, businesspeople, and even some government representatives³³⁵ in China still have a generally underdeveloped respect and knowledge of the importance of IPR, IIPs that tout “assimilation,” “absorption” and “re-innovation” as fundamental methods of innovation and patent development may very well be used to justify, or actually interpreted to encourage, development of products, services and processes in a way that nearly outright encourages infringement.

Such policies may to some extent unintentionally increase administrative actions, arbitration, and/or litigation, tying up resources of the state that otherwise should have been preserved for more ‘appropriate’ cases. More appropriate cases herein are those that would arise in a more ‘neutral’ regulatory environment, and/or channeled into more appropriately strengthening the IPR system and otherwise fostering quality patents in China.

Moreover, it is concerning that such policies are explicitly at the heart of judicial approaches to future patent cases as is reflected in the *December 16th 2011 SPC Opinion* (see Part 1. para 3, and Part 3 para. 12 as quoted above), which deserves clarification to ensure it does not discriminatorily favour right-holders in infringement cases. For one, it deserves clarification as to if the opinion might be used in certain circumstances to favor an alleged infringer if he/she was acting in the name of such IIPs. It also deserves clarification if the opinion could possibly create a situation where infringement cases involving products, services, and processes in strategic emerging industries specifically are dealt with different than other cases, creating a discriminatory adjudication environment.

Amidst this, it is important to note that the school of economic thought supporting incremental innovation policies (whether import-based or domestic-based) first mentioned in this section need not be connected with a logic supporting IPR infringement, whereas other strong academic studies suggest China need not rely on full-fledged imitation to build-up its innovative capacity. For example, Maskus, Dougherty, and Mertha (2005) finds inward technology transfer is the main source of new information creating technological advancement and structural transformation in China, and thus imitation of IPR, including patents, does not necessarily need to be a phase of China’s industrial development.³³⁶ This touches upon an important point that may be easily lost in the translation of IIPs into action in China.

III.3.1.2.2 Megaprojects vs. more effective models of innovation-building projects

A notable concern in China’s innovation drive is that its massive funding/commissioning of “megaprojects,” large-scale expensive projects run by only a few entities, is not the most effective way to foster key innovations and likely in-turn hinders the quality of patents that could have been produced if the projects were more effectively commissioned. As McGregor (2010) explains, these megaprojects, for example those commissioned by MoST, are meant to build up industries in China, including via creating innovation infrastructure. McGregor (2010), citing the opinions of a wide range

³³⁵ For example, although not due to shortage of recent efforts from the government to change this trend, a number of government offices throughout the country still use IP-infringing products.

³³⁶ Maskus, K. E., Dougherty, S. M., & Mertha, A. (2005). Intellectual property rights and economic development in China. In Fink, C., & Maskus, K. E. (Eds.) *Intellectual property and development: Lessons from recent economic research* (pp. 295-332). New York: Co-publication of World Bank, Washington D.C. and Oxford University Press. Retrieved from <http://siteresources.worldbank.org/INTRANETTRADE/Resources/Pubs/IPRs-book.pdf>

of scientists, finds the weakness of such megaprojects is that innovation best comes from individuals or comparatively smaller teams working on particular projects that they are passionate about and for which their qualifications, proposals, and work have undergone solid examination.³³⁷ These flaws in the megaproject approach as an optimal strategy to produce higher quality patents in the short-, mid-, and long-term are compounded with those mentioned in the earlier section in this Chapter on IPR ownership prerequisites for participation in such programs.

As mentioned previously, it is worth noting that some recent measures appear to at least realise MoST's approach to S&T projects needs reforming, although it does not appear that they fundamentally challenge the size composition of S&T megaprojects. With the exception of Part 6, measure 61, other provisions from the *2012 National IP Strategy*, i.e. Part 3, measure 17; and Part 6, measures 58, 60, and 64 all continue to use the keywords "major projects" in a way that may indicate a lack of reform to the megaproject approach to MoST projects but rather only more peripheral reforms (see the "Introduction" section of the Annex for translated text of these provisions). Additionally, Part 3, Section 4, Article 1 of the *SC Notice on IPR in Strategic Industries* mentions initiatives for IP strategy for building IPR in "major technology projects."³³⁸

III.3.1.2.3 Financial incentives not directly linked to IP, but still closely impacting patent quality

III.3.1.2.3.1 "National champion" logic embedded in EIDF subsidies

Further to the above discussion on megaprojects, the structure of some funding in the Electronics and IT Development Fund (EIDF) raises some concerns in relation to patent quality given its focus on large companies. The EIDF was first developed in 1986 and is believed by some to have helped China generate a significant number of patents. For example, Stewart (2007) notes sources consider the EIDF helped generate 2,456 patents. The same source notes that as of 2004, the fund had invested more than 3.9 billion RMB in 1,859 projects via direct finance and other forms of support to the electronics and information technology industries.³³⁹ It is notable that some EIDF funds seem to be focused on large companies (*dà gōngsī*, 大公司); for example, the *Opinion on Accelerating the Large Company Strategy in the Electronics and Information Industry*, issued by MIIT on January 28th 2005, and which is still effective, states:

Section 5, Article 1.2: "Provide support to the leading large companies. Within government procurement, for key projects (such as new internet, 3G, digital TV, software, automobile electronic product projects, and so on), [those in] the EIDF, the scientific fund... preference will given to these large companies."³⁴⁰

While it is standard for governments to establish minimum threshold requirements in government procurement, it is different to stipulate that "large companies" full-stop be given preference in government procurement tendering. As such, it is worth considering that even if the EIDF has

³³⁷ McGregor (2010). (Note: Although on the other hand, one may argue the approach is in fact effective for building up certain large scale infrastructure which is best commissioned to a limited amount of people so it relatively seamlessly links up. Also there may be additional near-term employment-based rationale behind such large scale projects.)

³³⁸ Part 3, Article 2: "We shall promote the planning and implementation of intellectual property rights strategy of major technology projects with a focus on industry development..."

³³⁹ Stewart, T. (2007). *China's industrial subsidies study: High technology*. Trade Lawyers Advisory Group. Retrieved from <http://www.uscc.gov/researchpapers/2008/TLAG%20Study%20-%20China%27s%20Industrial%20Subsidies%20High%20Technology.pdf>

³⁴⁰ Retrieved on March 20, 2012 from http://www.chinabaike.com/law/zy/bw/gw/xc/1355307_2.html Note: Translation from the European Chamber thus is unofficial.

contributed to a significant number of patents in China, if administered in a way that better fosters competition amongst all types of qualified companies it may better contribute to raising patent quality and related innovation in China. Herein, one area to investigate is the evidence behind government statements touting the achievements of the “Large Company Strategy,” inclusive of the aforementioned measure and six specific companies it has been used to support.³⁴¹

In an increasingly competitive market, sources argue that the “national champion” models once used by nations like South Korea no longer are as relevant for the Chinese government to follow.³⁴² As such, pushing development of these Chinese behemoths is not only an antiquated approach to building innovation and economic competitiveness but may result in spending that could have been better channeled through different more merit-than-size-based attempts at building innovative and competitive enterprises.

III.3.1.2.3.2 Other subsidy funds

A variety of requirements in subsidies not specifically discussed thus far, while less directly related to IND-IP-based requirements, may also create somewhat of a drag on balanced innovation and patent quality given their blatantly discriminatory/WTO-inconsistent nature. In particular, there is evidence of a variety of subsidies offered on the basis of export performance, import substitution, and to domestic companies in specifically defined industries.³⁴³

III.3.1.2.4 Lack of transparency in policy formulation and implementation

An often repeated issue, the lack of transparency and uncertainty as to what rules are being drafted and implemented; limited time to comment on these measures before enactment; and lack of translated measures in one or more of the official languages of the WTO also pushes companies to be more reluctant to innovate and contribute to the building of highest-quality patents and related innovation in China. This is a longstanding problem and is not fully aligned with China’s WTO commitments on transparency.³⁴⁴

³⁴¹ Note: Interestingly, *MIIT’s Report for the 60th Anniversary of the PRC*, issued by MIIT on September 18th 2009 implies the *Opinion on Accelerating the Large Company Strategy in the Electronics and Information Industry* has had a positive impact. Specifically, Part II, Section 2, Para 4 of the measure finds: “*The ‘Large Company Strategy’ has remarkable achievement. The ‘Large Company Strategy’ was developed in 1993 when the new MIIT was established. SVA, Changhong, Caihong, Panda, Lenovo and Hualu have been selected as 6 key companies to support. During this time, MIIT issued the ‘Implementation Measures on Large Company Strategy in Electronics and Information Industry.’ MIIT’s ‘Opinion on Accelerating the Large Company Strategy in the Electronics and Information Industry’ has accelerated this strategy. Industry integration is rising and production is concentrated in large companies and groups. Leading companies’ image and brands are becoming prominent.*” (Measure retrieved on August 15, 2012 from <http://www.miit.gov.cn/n11293472/n11293877/n12511031/n12511106/12693827.html>)

³⁴² Breznitz and Murphee (2011, September)

³⁴³ Prud’homme (forthcoming 2012)

³⁴⁴ See GATT Article X, GATS Article III, TRIPS Agreement Article 63, as well as China’s WTO plus commitments in its Report of the Working Paper on the Accession of China to the WTO (e.g. Part VII Other Issues, Section 3. Transparency, Article 334: “*The representative of China confirmed that China would make available to WTO Members translations into one or more of the official languages of the WTO all laws, regulations and other measures pertaining to or affecting trade in goods, services, TRIPS or the control of forex, and to the maximum extent possible would make these laws, regulations and other measures available before they were implemented or enforced, but in no case later than 90 days after they were implemented or enforced. The Working Party took note of these commitments.*”). Note: lack of transparency is not necessarily intentionally meant to try and “promote” patents and innovation, although sometimes in fact is, and either way can discourage quality patents and innovation.

III.3.1.2.5 Less than optimal coordination of industry park initiatives

It is arguably difficult for many industrial parks in China to best build innovation and produce highest-quality patents given their less than optimal coordination with each other (this situation also more generally applies to different economic-related zones in China at large, not only industrial parks within these zones). Provincial/municipal and local governments often afford industrial parks within their purview a range of tax incentives outside R&D Centre-specific incentives to attract certain companies and industries, for example, among others, refunds on VAT, BT, and EIT paid by companies' value-added operations which while not exclusively tied to R&D operations could be in part used to encourage innovation and in turn quality patent filings. A variety of industrial parks within provinces seek to attract certain types of industries using the aforementioned financial tools as well as certain outreach strategies, but in many cases go about this largely unilaterally whereas several industry parks within one province/municipality could be seeking to boost the exact same niche industry.

This situation hampers patent quality and related innovation in China that likely could otherwise be realised through improved coordination among industrial parks. On one hand, some might argue that industry parks need not coordinate among themselves to best stimulate innovation and resulting patents as the forces of competition would naturally lead to efficiency optimisation therein. On the other hand, this viewpoint does not fully consider the fact that China does not operate in the hands-off fashion that would perhaps in another country allow this approach to work, whereas China's provincial and local governments are bound by a centrally-promulgated innovation policy that they need to implement, albeit in many cases with decent room for discretion in implementation. For example, provincial and local governments are tasked with building up strategic emerging industries as outlined in China's national 12th Five Year Plan (see the Introduction section for a full listing of these industries); however, the fact remains that not every industry park within a province/municipality is capable, nor is it necessarily economically wise, for them to all attempt to build these particular industries. And there is questionable economic utility in, for example, multiple industry parks in a province trying to build their own biomedical engineering equipment industry when they could likely better stimulate other competitive industries. As such, one could argue that if local and/or provincial/municipal governments in partnership with the industrial parks' management were to provide improved management of what an industrial park, given its strengths as measured by an assessment, should focus on as distinct from another industrial park, this may ultimately lead to more mid- to long-term innovation efficiency gains. However, without this improved coordination, the current situation creates inefficiencies and ineffectiveness that likely somewhat hamper development of quality patents and related innovation in China.

III.3.1.2.6 A range of other policies

A variety of other policies are likely in some ways inhibiting the development of the highest-quality patents in particular and related innovation in China. A list of policies not discussed in this study that may more indirectly inhibit efficient and effective innovation and development of quality patents can be found in the European Chamber's Annual Position Paper, among other sources.³⁴⁵

³⁴⁵ For example, see Atkinson (2012). Note: one important issue herein is China's increasing industry consolidation of the market for rare earth elements, which are key inputs in highly innovative and patented technologies, which in some circumstances has enabled monopolies to not honor contracts of supply with private businesses, which in-turn may inhibit important R&D efforts already in China (Source: 2012, January 19 – Consultations with a member of the European Chamber)

III.3.2 Summary:

China has a wide-range of patent-specific and other patent-related policies in-place, many of which are at least partially meant to encourage patents, although some of these policies in effect can actually discourage quality patents, and highest-quality patents in particular, and related innovation. The most concerning of these policies are explored in this Chapter.

III.3.3 Recommendations

III.3.3.1 Core recommendations

Sub-section 3.1

- 8. Recommendation: Revise the award criteria in the patent filing subsidy application process, and improve oversight of the patent filing subsidy program.** This system should be codified at the central-level and mandatorily executed in all provinces/municipalities although with flexibility for these provincial/municipal levels to cater the system to their own needs.

8.1 A well-equipped appraisal committee should be set-up to oversee the patent filing subsidy awarding process. The unit should be staffed with technical and legal experts who will provide a formal evaluation of a patent application. The appraisal committee may set forth a standard ranking for these applications. The unit might also be staffed with other experts that would optimally help evaluate how much subsidy monies to provide an applicant based on the aforementioned evaluation. Only those patent applications approved by the appraisal committee would be provided subsidies (see recommendation below for further details).

Patent filing subsidies should be focused more so if not completely on invention patents as opposed to utility models or design patents, and therein subsidies might be geared more so on patentees whose solution has particularly high inventiveness.

A mechanism should be established to ensure an appropriate awarding of patent fees after the subsidy appraisal committee vets prospective patents for subsidisation. Some governments are already only granting subsidies to patents that are granted, although this does not appear to be the case across all of China. In order to prevent unintended stifling of innovation in SMEs with little money to spend up-front on the patenting process, subsidies should not necessarily be only provided *after* the patent is granted, but could be structured in a way that they are appropriately provided to patents that are ultimately granted. Any one, or a combination of, the examples described hereafter are mechanisms that could be used to ensure that subsidies are provided to patents that are granted while also not overly discouraging applicants from applying for subsidies:

Method A1: (1) Applicants can apply for patent filing subsidies for a set of patent-related fees (hereafter the “Patent Fee”). Initially, the Patent Fee is waived. (2) If the patent is granted by SIPO, the applicant then pays a non-refundable fee to then have the application sent to an appraisal committee for consideration for subsidisation of

the Patent Fee. If the patent is approved by this committee, the applicant need not pay any of the Patent Fee (outside the aforementioned non-refundable appraisal committee review fee). However, if the patent is rejected by the appraisal committee, the applicant must pay back the Patent Fee at a to-be-determined, non-subsidised, interest rate under a defined payment plan.

Method A2: (1) An applicant should pay for a patent Search Report from an external agent accredited by SIPO, and SIPO should regulate the fees such agents can charge for these reports. (2) The applicant then applies to the appraisal committee directly, paying a non-refundable fee and enclosing the aforementioned completed Search Report in their application, for their Patent Fees to be subsidised. (3) (a) If approved by the appraisal committee, the applicants' Patent Fee (outside the aforementioned non-refundable appraisal committee review fee) is waived, and the cost of the initial Search Report is reimbursed. The applicant's application is then automatically submitted to SIPO examiners for a patentability review. The aforementioned waiving of the Patent Fee and reimbursement of the Search Report remains as such regardless of whether the patent is subsequently granted by the examiners. (b) However, if rejected by the appraisal committee, the applicant is only reimbursed for the Search Report fee, or a portion of the Patent Fee is deducted when the applicant applies (if they choose to apply) for SIPO examination of the application, and the applicant must pay the rest of the Patent Fee.

Method B: (1) An applicant should pay for a patent Search Report from an external agent accredited by SIPO, and SIPO should regulate the fees such agents can charge for these reports. (2) The applicant then applies to the appraisal committee directly (for free) for their patent to be subsidised, enclosing the aforementioned completed Search Report in their application. (3) (a) If approved by the appraisal committee, the applicant is issued a formal certificate saying they do not have to pay X% portion (e.g. 75%) of the Patent Fee, including the Search Report fee. In the instance that a patent that is approved for subsidisation by the patent subsidy appraisal committee is not actually granted by SIPO examiners, several steps should be undertaken. First, the application should undergo automatic re-examination with the PRB. Pending the reasons for not granting the patent in the first review (and thus the need for re-examination), the re-examination fees should be covered by the appraisal committee rather than the applicant. If deemed fully valid after re-examination, the appraisal committee could pay the applicant an additional amount towards the Patent Fee (e.g. the remaining 25% of the Patent Fee, meaning 100% of the Patent Fee and the Search Report fee would have been ultimately subsidised by the government). If the patent is partially invalidated or fully invalidated by the PRB, pending the reasons, the appraisal committee could still pay the applicant the aforementioned additional amount of the Patent Fee, or instead require the applicant pay this amount. (b) If rejected by the appraisal committee, the applicant would only be reimbursed for the Search Report, or instead a portion of the Patent Fee would be deducted when the applicant applies (if they choose to apply) for the first SIPO examination of the patent. The applicant must pay the rest of the Patent Fee.

Note: To ensure integrity in the review process within Method A1, A2 and B, it might be prudent not to indicate on the patent application subject to the first SIPO examination whether the application is involved in the patent filing subsidy program.

In the instance a set of roughly ‘equally inventive’ patent applications are vying for limited subsidy funds, one might consider a ‘tie-breaker’ criteria for deciding how to grant patent subsidies. For example, the government might support smaller and less well-funded entities applying; however, a thorough policy assessment should be run before any such approach is adopted as a matter of policy. Additionally, one might not only consider the quality of the patent reviewed, but the performance of the patent applicant in terms of serving as a losing defendant in certain IPR infringement cases, among other criteria.

8.2 A supervision committee should be set-up to oversee an opposition mechanism and post-granting monitoring and evaluation. This committee would solicit written opposition comments from third-parties, via a notice in a gazette, on if a patent selected for subsidisation should in fact be subsidised or if an already subsidised patent should remain subsidised. Also, a database with subsidy-related information should be maintained. Through review of this database and the opposition process, patents to receive or already receiving subsidies should be scrutinised, particularly in the instance a patent application procedure is deliberately terminated by the applicant.

Several components should be added to the mechanism to oppose and revoke subsidies. First, the grounds for opposing subsidisation should be clearly stipulated before this process is initiated. Second, to prevent abuse of the opposition process, if opponents abuse the opposition process with unreasonable oppositions, they will be warned/receive a certain type of warning(s) and other punitive action may be taken. Third, a formal and well-functioning mechanism should collate relevant information from State Administration for Industry and Commerce (SAIC), GAC, SIPO, the Ministry of Public Security (MPS)/police, procurators, and other IPR administrative enforcement bodies; arbitration committees; and the judiciary; as well as rights holders and other parties relevant for challenging a particular patent’s/ applicant’s access to subsidisation.

In a proven instance of bad faith filings, filing subsidies should be repaid with interest and additional fines imposed. In this instance, the government should (1) ensure any subsidies given for patent filing and development are repaid with interest, and (2) additional fines that become increasingly steep per number of invalidations by a single filer should be considered for repeat offenders (for example, those who file more than X bad faith filings are fined between X-Y RMB, those who file more than Y are fined between Y-Z RMB, and so on). Monies must be repaid to the granting institution based on a repayment system developed by SIPO. As relevant, and pending the Method used as suggested above, the appraisal committee member who approved such a patent for subsidies should be penalised in his/her performance review.

- 9. Recommendation: IIPs premised exclusively on IND-IP-based requirements (as opposed to also on IP licensing from abroad) that are linked to subsidies and other financial incentives should be clearly nullified.** This should be required in the absence of publically available, rigorous analyses (including empirical analyses) that support the idea that IND IP requirements as currently conceived and linked to financial incentives *best* enable economic, environmental, and/or social progress in China in a way a less discriminatory policy approach cannot. To be sure, “best” herein should be based on solid scientific, economic, and legal rationales.

9.1 If any measure, for example an IIP rule mentioned within this study, has in fact been invalidated/made null but is still published online, either remove the regulations from online government sources or require clear indication on the actual text of the measures posted that they have been nullified.

10. Recommendation: Amend the requirements in current IND-IP-based IIPs to instead include different, arguably better, determinants of the success of an enterprise in building quality patents. For example, criteria could be set in terms of high and productive investments in R&D (e.g. measured via R&D returns), invention patents in-force for longer than 6 years or an otherwise appropriate period of time, products or services with high value-added and commercial value, among other criteria.

11. Recommendation: Policy advice should focus less on certain current patent-based incentives reviewed in this study and encourage more sustainable incentives to boost innovation and competitiveness.

11.1 Set forth policy advice that mandates all incentives specifically for patent development set out by provincial/municipal and local levels – whether this support is for patent filings, transformation of patents, monetisation of patents, or other forms of patent development – first meet certain verified patent quality thresholds.

11.2 Consider requiring an assessment on the social impact of certain incentives.

11.3 Policy advice should be revised as necessary to better encourage employers to offer incentives to their employees to innovate not just for the sake of producing patents but to also optimally contribute to the overall competitiveness of the company, research institute, or university.

12. Recommendation: Consider elevating the role of MOFCOM in innovation policymaking to be more on par with MoST and NDRC. In addition to other mechanisms, more formal development of the responsibilities within the Inter-Ministerial Joint Conference could be used as one mechanism to monitor this power-sharing.

13. Recommendation: Include foreign and Chinese business and industry associations and other experts in the formulation process for specific regulations on IP management in line with the *Provisional Regulations on Intellectual Property Management of the Major National Scientific and Technological Projects* (as mentioned in Part 6, measure 60 of the *2012 National IP Strategy Plan*), and other related measures.

14. Recommendation: Conduct an audit or series of audits, led by China's National Audit Office, on the workings of all major innovation-related funding programs and other key innovation policies in China. This report could form the basis for improving related programs and policies as discussed among SIPO, MoST, and other relevant bodies involved in patent and innovation strategy and implementation.

15. Recommendation: Relevant government bodies should keep transparent websites that track government funding according to a variety of specific reporting criteria.

15.1 Consider consolidating information on all major innovation-specific funding programs in a concise manner in English or another WTO language on relevant government websites. The EC-funded project China Access4EU has already compiled

this for many government funding programs at a helpful level of detail, although some major programs appear not to be covered, and the full details of subsidies at provincial and local levels are not clearly outlined.

15.2 Relevant government bodies should keep transparent websites which provide a listing of those entities actually awarded government funding, in addition to other key details. Specifically, the site should present the disaggregated scores for project awards on a set of clearly listed criteria for qualifying for such funding; in addition to details of projects they are working on; and any other relevant information necessary to ensure transparency and foster competition.

16. Recommendation: IND IP IIPs linked to subsidies and any other financial preferences (inclusive of those based on WTO inconsistent provisions) should be nullified. Financial incentives should be revised to be less discriminatory and better promote innovation and patent quality.

16.1 All WTO inconsistent subsidies with IND IP provisions should be clearly nullified and voided. And all relevant subsidies should be reported to the WTO's Committee on Subsidies and Countervailing Duties.

16.2 All subsidies and other financial support that are not necessarily WTO inconsistent but are not awarded equitably to qualified enterprises, including support that is solely innovation-focused, should be opened up equally *de facto* to both foreign and domestic entities.

16.3 As a replacement for IND IP criteria in export subsidies, perfect an outreach program where export-intensive Chinese enterprises are better informed of the need to register their IPR abroad, and are better provided guidance on how to do so. This might, for example, be modelled off of the China IPR SME Helpdesk, a project funded by the EC for EU companies operating or looking to operate in China, and which the European Chamber has been implementing for several years now.

17. Recommendation: Enact specific revisions to the criteria for HNTE status.

17.1 Revise Part V, Section I, para. 1 of the Application for Recognition of Hi-tech Enterprises and reform the actual approval process to notably raise the threshold for the quality of utility models accepted as meeting the IPR requirements for HNTE status.

17.2 Consider adding the preconditions for receiving HNTE status that enterprises are not frequently a losing defendant in patent infringement cases, nor are repeatedly convicted of bad faith filings. These conditions might also be binding while receiving recognition of HNTE status, whereas in certain extreme cases HNTE status might be revoked if the conditions are not met.

17.3 Revise Part V, Section I, para. 4 of the *Working Guidance on the Recognition of Hi-tech Enterprises* to state that qualifying enterprises need not have IP owned in China, but the China affiliate can qualify for HNTE status if possessing appropriate R&D personnel and funding so that it can reasonably be expected that these resources will lead to creation of quality patented solutions in the future.

17.4 Consider revising current Chinese law to, subject to reasonable conditions, state that an HNTE shall own the IP from its research in China but may freely license it to foreign-affiliated companies or third parties without effect on its HNTE status.

17.5 Fully contingent on the above recommendations first being implemented, then consider phasing out the option to use utility models to qualify for HNTE status, instead exclusively requiring filings of quality invention patents. The Application for Recognition of Hi-tech Enterprises could be revised accordingly.

18. Recommendation: Open at least partially more of China’s government-sponsored S&T funding programs to foreign entities, and revise IPR restrictions therein to allow project partners to own the knowledge produced from the projects, and beyond this simply require that the project partners reach an agreement among themselves on IPR ownership and licensing and explicitly allow IPR ownership transfer and licensing. This should include replacing the term “national interest” (and perhaps “important public interest”) in Article 20 of the *Law on Scientific and Technological Progress* with language that provides a more reasonable and precise scope for exclusivity claims.

19. Recommendation: Open a draft of MoST’s *12th Five-Year Special Plan on IP Work of Science and Technology Innovation* (mentioned in Part 6, measure 59, of the *2012 National IP Strategy Plan*) for public comments for at least 60 days.

20. Recommendation: Provide full transparency into the makeup of MoST’s Patent Assessment Index System of National Technology Invention Awards and how that might be revised in the future to better foster patent quality.

21. Recommendation: Revise several components of the *TIER*:

21.1 Revise Article 27 to clearly allow negotiation on ownership of improvements on technology (as this may be fundamentally needed in case of technology transfer related to toll manufacturing and service R&D).

21.2 Revise Article 2 to indicate that experimental data at an early stage of research or derived from pure service R&D is excluded from the approval requirements set forth in that article.

21.3 MOFCOM and other relevant government ministries should create a working group with industry and other experts to improve the clarity of the coverage of technologies in the current category of restricted and prohibited import/export technology.

21.4 Revise the *TIER Measures* provisions on liability of the technology transferor or licensor in an infringement claim raised by a third party. These revisions should more fully consider instances where current obligations create an undue burden on the licensor, e.g. in areas with patent thickets and where licensed technology is still not fully developed.

- 22. Recommendation: Ensure all overly discriminatory *de jure* and *de facto* restrictions on foreign entities accessing the Technical Committees in which standardisation is decided are removed, and more reasonable access is granted to patent pools and essential patents.** The European Chamber, among other industry associations, should be consulted to provide a specific list of barriers to be removed herein.
- 23. Recommendation: Reform the CCC Mark accreditation process in line with recent recommendations provided by foreign governments.**
- 24. Recommendation: Establish a Working Group with topical sub-groups made up of government officials, SSOs, experts, and industry representatives (foreign and domestic) to investigate and provide recommendations on improving standard-development and oversight policy in China.** Policies reviewed would include information security regulations, including the MLPS, that may unnecessarily discourage R&D by foreigners; information restrictions on patent-related requirements needed for implementing standards; intentional development of national standards based only on the capabilities of Chinese SOEs; intentional lack of licensing essential patents to foreign enterprises, particularly those in the telecom industry; potentially disconcerting requirements involving TCM chips; IP disclosure to competitors during the chemical project approval process; IP leakage and other issues surrounding SFDA's approval process for pharmaceuticals; and all other standardisation policies flagged as a drag on patent quality. Among those needed to address the aforementioned issues, recommendations to be considered by the Group include Key Recommendation #5 from the European Chamber's 2012/2013 PCR Working Group Position Paper regarding chemical plant approval, and Key Recommendation #6 from the European Chamber's Standards and Conformity Assessment Working Group 2011/2012 Position Paper. The Group could be expanded to cover other concerning standardisation policies not necessarily related to patent quality.
- 25. Recommendation: A taskforce should be created among industry associations in China (Chinese and foreign) to conduct an audit of all raw deals and other forms of forced-disclosure of know-how their members have experienced.** Complainants should provide solid evidence as to how the instances harm patent quality and innovation in China. Only the strongest cases should be included in a final report. The report should be published with recommendations and discussed with the MOFCOM, among other ministries.
- 26. Recommendation: Implement Key Recommendation #3 in the European Chamber Position Paper 2011/2012 (2011) on clarifying the rules governing inventor remuneration.** That recommendation suggests the SPC or SIPO develop and interpretation on how certain general questions on inventor remuneration will be handled in a dispute. Specifically, clarification is needed that the direct employer of the inventor under a contract bound by Chinese labour law is the only one liable for inventor remuneration, and that labour contracts and company regulations should only be challengeable in extreme cases of willful neglect of the rights of the inventor.
- 27. Recommendation: In line with the European Chamber's submission on this topic, consider at least very broadly clarifying certain issues with the *Measures on Compulsory Licensing*.**

III.3.3.2 Other recommendations

Sub-section 3.2

- 28. Recommendation: A taskforce of scholars, government officials, and other experts should be commissioned to conduct a rigorous review of the progress thus far and expected future results of China's IIP policies on assimilation, absorption, co-innovation and re-innovation. The report should be published with recommendations and discussed with the government.**
- 29. Recommendation: Continue, with renewed vigor, discussions in the WTO on including non-violation complaints in the *TRIPS Agreement*, with a view to removing the moratorium on use of these provisions.**
- 30. Recommendation: Delink EIDF and any other subsidies from preferential policies that without mention of procurement threshold requirements full-stop give preference in government procurement tendering to "large enterprises."**
- 31. Recommendation: MoST to re-consider its current approach to innovation and patent filing through megaprojects. As feasible, consider having at least some of these initiatives more focused on basic research and key fields via highly competitive and smaller scale, peer-reviewed projects.**
- 32. Recommendation: Ensure transparency regulations as stipulated in China's WTO commitments are enforced, including on comment periods and notifications of measures, and ensure relevant measures are published in an Official Journal and in a WTO language.**
- 33. Recommendation: A formal relationship should be developed between provincial technology transfer centres and the European Chamber, as well as with the European Chamber and industrial parks in those regions, with a view to better facilitating matchmaking activities with European businesses and Chinese counterparts.**
- 34. Recommendation: Set forth guidance, with some form of penalties for non-compliance, that provinces/municipalities, and more so industrial parks and larger zones within a province/municipality, when possible and appropriate should coordinate with one another in determining their respective competitive advantages and developing accordingly specific plans to attract distinct industries/sets of companies to their industry parks.**

III.4 Chapter 4: Rules and procedures for reviewing patent applications and those for enforcing patents

III.4.1 Analysis

III.4.1.1 Sub-section 4.1: Patent application review

Introduction: This sub-section investigates how some aspects of the patent application review process in China can stifle patent quality and related innovation.

III.4.1.1.1 Overly burdensome “Confidentiality Review” required before filing patents abroad

China’s *Patent Law* (“*Patent Law* (2008)”), the third revision on which was issued on December 27th 2008 by the Standing Committee of the National People’s Congress, and its implementing rules set forth an overly burdensome Confidentiality Review process (also often called a “Confidentiality Assessment” or “Confidentiality Examination”) for all foreign patent filings for inventions made in China’s territory. Article 20 of the *Patent Law* (2008) states that when an owner of an invention or utility model “completed in China,” i.e. for which the substantive part of the technical solution is completed in China, wants to file that patent abroad they must request a Confidentiality Review from SIPO before doing so.³⁴⁶ Article 8 and 9 of the *Implementing Rules of the Patent Law*, as amended in January 2010, provide details on this Confidentiality Review procedure whereas Article 9 stipulates if it is determined that the solution “*may relate to the security or vital interest of the State and is required to be kept secret,*” a confidentiality notice is sent to the applicant with which they have to comply,³⁴⁷ and the patent will not be published (even if approved in China) and it cannot be filed in a foreign country.

The level of ambiguity as to what constitutes a solution that “relates to the security or vital interest of the State” opens up the possibility that a wide-range of solutions might fall within this category and thus face complications. This puts a damper on entities’ ability to internationalise and may directly discourage development of a wide variety of patents that could conceivably fall within this area of regulation.

Further, even if the Confidentiality Review reveals no problem for first filings abroad, as should be the case in most instances, the requirements for this review create a burden because the texts for the review need to be translated or a costly PCT application has to be filed with SIPO by external counsel in order to comply with SIPO’s request.³⁴⁸ At the very least, these requirements cost companies more time and money to develop and commercialise or otherwise productively transform certain solutions into productive assets, which in turn discourages certain innovation and patent filing. And particularly disconcertingly, the requirements may discourage competitive companies with quality patents that are more likely than those with the lowest quality patents to seek to internationalise in the first place.

³⁴⁶ Measure retrieved from <http://www.lawinfochina.com/display.aspx?lib=law&id=7289>

³⁴⁷ Measure retrieved from http://www.ccpit-patent.com.cn/references/implementing_regulations_patent_law_china.htm

³⁴⁸ 2012, May 9- Consultations with Dr. Oliver Lutze in Shanghai

Even more troublesome is that additional Confidentiality Reviews are burdensomely required on patent applications amended during the priority filing period even if such amendments are within the scope of the original claims. It is usual practice that patent applicants in certain fields (e.g. chemical arts) amend patent applications shortly before foreign filings in many countries within the 12 month priority period. Such amended texts, according to SIPO, need another Confidentiality Review as the amendments need to be checked even if in the scope of the original claims. In most cases, this additional Confidentiality Review is not possible anymore at a time so close to the end of the priority period. This puts the resulting Chinese patents at risk that they can be invalidated if no security check has been performed on the amendments. This discourages the innovation activities of those who conduct R&D in China with a view to filing patents in China and abroad on such R&D.³⁴⁹

III.4.1.1.2 Concerns over regulations on the green channel for patents

Uncertainties in the application of expedited examination of patents via what is often referred to as “green channel” approval may inhibit patent quality. As noted in the European Chamber’s January 13th 2012 response to SIPO’s Call for Comments on the *Administrative Measures on Prioritised Examination of Patent Applications (Draft)*, while these measure are welcome in general, there are uncertainties as to whether the measures will translate into a less rigorous examination process for patents, both in terms of Substantive Examinations for invention patents and other review for utility models. This would be concerning and may jeopardise necessary patent quality reviews. Also, in absence of assurances as to how the process will play out in practice, there are concerns that application requirements for prioritised examinations may be implemented in a less than egalitarian manner.³⁵⁰

Elliot Papageorgiou, Executive and Partner at Rouse in Shanghai, further explains some of the most serious concerns surrounding China’s approach to expedited examination of patents:

“The most pressing concern would be how SIPO would keep track of and take account of the pending applications which have not been prioritised but of course may still constitute relevant prior art for any expedited application. This problem is magnified as a result of the large volume and growth in patent filings in China. If this potential issue is not managed appropriately, situations could arise where expedited applications lead to grants despite existence of novelty-destroying prior art contained in prior-filed but later examined non-expedited applications.”³⁵¹

The *Administrative Measures on the Priority Examination of Invention Patent Applications*, issued on June 19th 2012 by SIPO, may address some of these concerns regarding the assessment of *prior art* for expedited examination of invention patents. For example, Article 7 of the measures requires a Search Report be conducted and submitted as part of an application for prioritised patent examination on invention patents.³⁵²

However, there are still a number of ambiguities in the rules surrounding the expedited patent review process in China. It is will also be helpful to seek assurances as to how the green channel for

³⁴⁹ 2012, May 9- Consultations with Dr. Oliver Lutze

³⁵⁰ European Chamber’s response to SIPO’s Call for Comments on *Administrative Measures on Prioritised Examination of Patent Applications*, submitted to SIPO on January 13th 2012.

³⁵¹ 2012, June 12 - Consultations with Elliot Papageorgiou in Shanghai

³⁵² Measure retrieved from http://www.sipo.gov.cn/zwgs/ling/201206/t20120621_712805.html

Article 7: “To go through the priority examination formalities, the applicant should submit the following materials...the search report in prescribed format provided by the unit that is qualified to conduct patent searches, or the search report, examination report and the Chinese translated version for the search report and examination report provided by the patent examination institutes in other countries or regions.” (Translation from European Chamber thus is unofficial.)

prioritised patent examination in strategic sectors, e.g. those in the *2012 National IP Strategy*, will be implemented,³⁵³ whereas there may be potential for these examinations to be implemented in an overly discriminatory manner and disconcertedly provide favourable review to lesser than highest-quality patents, and at worst low-quality patents, just because they are in an industry defined as strategic. As mentioned in Chapter 2, it is also worth seeking assurances from SASAC in particular regarding how this system is currently and will be applied to patents filed by SOEs. The requirement in Article 4 of the *Administrative Measures on the Priority Examination of Invention Patent Applications* that priority review will concentrate on “patents of great significance to national or public interests” does not allay these concerns.³⁵⁴ These factors may potentially create a patent review environment that may jeopardise an import filter of patents, or otherwise inappropriately favour lower quality patents over higher quality ones.

III.4.1.1.3 Genetically modified plants and other genetic material are unreasonably excluded from patentability

There are restrictions on core inventions in the agro-sciences, whereas a notable amount of genetically modified plants are excluded from patentability as clarified by SIPO’s *Patent Examination Guidelines (2010 revision)*. Genetically modified plants can only enjoy plant variety protection (PVP) because wider protection on plants regardless of variety is excluded in China. This is compounded by the fact that China has not ratified the International Convention for the Protection of New Varieties of Plants as revised in 1991 (“UPOV ‘91 version”)³⁵⁵ for PVP protection. Patent protection for whole plants, regardless variety, or plant cells, would better foster R&D activities in the field in China.³⁵⁶

Also, important claims for genetic material, like DNA, are only allowed in a very narrow scope, thus not giving the applicant sufficient protection on such materials. Further, the claims that are allowed can be easily circumvented by using slightly modified homologous genetic material. This reduces the motivation to patent inventions in related fields, thus to a large degree denying China quality patents and related innovation.³⁵⁷

III.4.1.2 Sub-section 4.2: Patent-specific enforcement issues

Introduction: This sub-section investigates how certain patent-specific enforcement issues individually, and more so collectively, contribute to negative perceptions about the strength of the IPR protection environment in China, which in turn can somewhat stifle innovation and linked patent quality in China.

³⁵³ For example, Part 2, measure 15 in the *2012 National IP Strategy* sets forth an initiative to “improve the green channel for patent examination, accelerate the acquirement of IPRs by burgeoning strategic industries from their innovations. (SIPO, MoST.)” and Part 3, Article 3 of *SC Notice on Strengthening IPR in Strategic Industries* also sets forth an initiative on a green patent channel, stipulating: “We shall optimise the application and review system of intellectual property rights and shall establish and optimise the green channel for patent and trademark review...”

³⁵⁴ Article 4: “Invention patent applications which can have priority examinations include...other patent applications in need of priority examinations for their great significance to national interests or public interests...” Translation from European Chamber thus is unofficial.

³⁵⁵ Measure retrieved from <http://www.upov.int/en/publications/conventions/1991/act1991.htm>

³⁵⁶ 2012, April 18- Consultations with Dr. Oliver Lutze in Shanghai

³⁵⁷ Ibid

III.4.1.2.1 “Abuse of patent rights,” including “abuse of right of action” and “malicious prosecution actions”

In light of the well-known *Chint vs. Schneider* case, among other recent cases, Chinese companies have seen that they can successfully litigate against foreign adversaries to earn significant compensation.³⁵⁸ As a result, there have been a number of high-profile patent litigation cases brought by domestic firms against foreign firms. Some of the most concerning cases involve patents filed with the sole purpose of being used in litigation.

As detailed in Gao et al. (2011), the concept of “abuse of patent rights” deserves to be clarified in the *Patent Law* as at present it is overly general. Given weaknesses in application of the specific principles of “abuse of right of action” and “malicious prosecution actions” (which can be broadly thought of as filing a lawsuit solely intended to harm the defendant) in cases involving complex patents and ambiguity in the scope of patent claims, complainants in some cases, albeit not the majority of cases, can force accused infringers to undertake overly strong liability.³⁵⁹ This results in overly strict liabilities and provides a perverse incentive for litigation.

Sources suggest that many patents in China are filed for the sole purpose of being used for retaliation and/or to first initiate litigation. As cited in McGregor (2010), low-quality patents are often used in China to retaliate against foreign companies inside China that have filed cases outside China against Chinese companies. As mentioned in Chapter 1, some sources go as far as to suggest that more than 50% of the patents filed with SIPO “are of foreign innovations with the sole intention of suing the same for patent infringement.”³⁶⁰ This concern, where patents are used as first-attack and/or tit-for-tat weapons, discourages business from setting-up and/or expanding operations in China, especially IP-reliant operations, and thus creates barriers in the way of China’s move to develop quality patents and related innovation.

As also mentioned in the Introduction and Chapter 1, given utility models are cheaper and easier to obtain than invention patents, in principle it makes the most sense for applicants to apply for utility models if they indeed intend to utilise their patents for the sole purpose of malicious prosecution actions. Bai and Cheng (2011) confirm that there have been concerning cases in China where utility models patents in particular were filed on solutions that are already part of the *prior art*, and these were used as “harassment tools.”³⁶¹ Such patents also can be used as “barriers to entry or restrictions on Freedom-to-Operate.”³⁶² Box 7 below provides two sample case studies on the usage of low-quality utility model patents in malicious prosecution actions in China.

³⁵⁸ Chint Group Corp. and Schneider Low-Voltage (Tianjin) Co. have been suing one another over patent infringement since 1999. Over the years, Chint lost a variety of cases that Schneider filed in Europe. Litigation in China spanned several years, whereas the most recent case was decided by the Wenzhou Intermediate People’s Court on September 29th 2009, finding that Schneider and its authorised distributor, Star Electric Equipment Co. Ltd. in Zhejiang, were guilty of patent infringement. The ruling was based upon Chint’s claim that Schneider had infringed upon a utility model Chint had registered in China. Schneider was ordered to cease patent infringement and pay 330 million RMB to Chint, although eventually settled to pay 157 million RMB. Even though reduced from the initial amount awarded, this was the largest compensation ever awarded in China in an IP dispute.

³⁵⁹ Concern mentioned in Gao et al. (2011), pp 90-104; 2012, May 17- Consultations with Lin Xu suggest that these cases are not the majority of cases.

³⁶⁰ “China’s Innovation Capacities May be Over-hyped” (2011)

³⁶¹ Bai, B., & Cheng, H. Chinese Supreme Court brings about sea change [sic] for patent litigation in China. *Allen & Overy*. Retrieved from <http://www.allenoverly.com/publications/en-gb/Pages/Chinese-Supreme-Court-brings-about-sea-change-for-patent-litigation-in-China.aspx>

³⁶² 2012, July 14- Consultations with Elliot Papageorgiou in Shanghai

Box 7: Case studies: low-quality utility model patents used in malicious prosecution actions in China³⁶³

The Forced Marriage

An international escalator company (“Company”) was approached by a former Chinese supplier upon having commenced its own production of an item of equipment which it formerly drew from that supplier. The former supplier gave the Company a choice, either to continue/recommence the prior supply arrangements (which the Company had terminated due to reliability problems) or it could pay a royalty for the licensing of a utility model that the former supplier had filed covering the product which the Company had formerly instructed the supplier to manufacture on its behalf. Upon the Company’s refusal to recommence the commercial relationship, the former supplier issued utility model infringement proceedings against the Company. The Company was faced with a difficult choice of recommencing now commercially unfavourable commercial relations with the former supplier and paying a license fee on a product that the supplier did not develop in the first place, or invalidating the relevant utility model and/or facing utility model patent infringement proceedings. The Company decided to pursue invalidation proceedings against the utility model and succeeded but only partially (which is not an unusual occurrence), thus having to run the risk of potentially infringing the remaining part of the utility model.

Patents as Barriers to Entry

A European specialty manufacturer of construction materials was importing machines into China utilising technology contained in their expired European patents. Their Chinese competitor derived a number of utility models from the European company’s expired patents by adding some immaterial improvements (which in fact were devised by the European company but it did not file for them as these improvements failed to meet the patentability threshold for inventiveness in Europe). Upon the European company’s market success in China, the Chinese competitor sought to draw upon those utility models to stop the European company’s advance in China’s burgeoning construction market. While the European company was successful in showing that the bulk of the utility model lacked inventiveness, the remaining, insignificant, improvements were held to be valid and enforceable. As such, the European company had a choice: cease to use the improvements in its products in China or pay the Chinese company what was an unreasonable royalty fee.

The trend of low-quality patents being used for malicious prosecution actions is compounded by a number of interconnected Chinese policies, practices and other trends. For one, it is exacerbated by the proliferation of NPEs in China mentioned in the section of Chapter 3 on standardisation policies. It is also compounded by, among other issues, ambiguities surrounding application of the anti-monopoly rules which are further discussed later in this chapter.

Light at the end of the tunnel?

All this said, it deserves to be recognised that there is commendable recent focus by the Chinese government on addressing the phenomenon of abuse of patent rights. The concept of abuse of patent rights was proposed for inclusion in the most recent (third) amendment to the Chinese *Patent Law* (2008), although not ultimately included therein; however, subsequent SPC opinions specifically mention the concept. For example, Article 18 of the SPC’s *Judicial Interpretation on Some Issues Concerning the Application of Laws to the Trial of Patent Infringement Disputes*, which came into effect on January 1st 2010, allows for declarations of non-infringement to bring declaratory

³⁶³ Ibid

judgment in their home courts, meaning patentees should be cautious about sending warning letters or making other threats of action unless they are prepared to sue.³⁶⁴ Moreover, Article 16 of the *December 16th 2011 SPC Opinion* finds “If anyone is fully aware that his/her patent falls within the category of prior arts or prior designs, however, still maliciously issues infringement warnings to or abuses its right of action against any party who legally uses such prior art or prior design and the trade partners thereof, courts may uphold the victims’ request for damages in light of actual situations.”³⁶⁵ In addition to the SPC, SIPO officials have set forth in policy statements like the *NPDS* and otherwise publicly announced intentions to limit abuse of patent rights.³⁶⁶

Given the recentness of some of the SPC and SIPO initiatives mentioned, it is not possible to determine the full extent to which the abuse of patent rights is still playing out and is not ideally being addressed in China. However, given the extreme importance that abuse of patent rights in China are effectively curtailed as soon as possible and the notable potential that more still needs to be done to achieve such a result, the issue was raised in this section. In assessing this issue further in the near future, the actions of utility model filers in China in particular warrant close attention,³⁶⁷ and jurisprudence from the courts should be monitored to see if penalties being granted and other judgments in cases of abuse of patent rights are appropriately deterring such abuses. Further, it is possible that changes to the *Patent Law* (2008) might be a useful way to ensure that the aforementioned intentions of the SPC and SIPO are effectively heeded.

III.4.1.2.2 Difficulties invalidating utility models given limits on submission of prior art

Sources suggest that under the *Patent Examination Guidelines* issued by SIPO on January 21st 2010 and effective on January 1st 2010 (“*Guidelines for Patent Examination [2010]*”), a petitioner is sometimes restricted to presenting too few pieces of *prior art* in an attempt to prove lack of inventiveness in a utility model invalidation case.³⁶⁸ According to Part IV, Chapter 6, Section 4, Sub-Section 2 of the guidelines, under “normal circumstances” petitioners are allowed to submit “one or two” pieces of *prior art* in a case involving a utility model patent; whereas petitioners can submit,

³⁶⁴ Clark, D. (2011). *Patent litigation in China*. New York: Oxford University Press, p. 101

³⁶⁵ Article 16: “It is imperative to properly handle the relations between patent protection and prevention of abuse of rights, and regulate abuse of patent right and abuse of the preliminary injunction system according to law. While protecting patent rights and safeguarding the right of action of the parties involved, courts shall also pay attention to preventing patentees from exercising their rights in obvious violation of the purpose of law, causing damage to their competitors by illegitimate means, obstructing fair competition or disturbing market order. If anyone is fully aware that his/her patent falls within the category of prior arts or prior designs, however still maliciously issues infringement warnings to or abuses its right of action against any party who legally uses such prior art or prior design and the trade partners thereof, courts may uphold the victims’ request for damages in light of actual situations. Courts shall apply legal conditions strictly, strengthen procedural protection, and be careful in taking measures for stopping patent infringement prior to litigation...” Also note Article 13 in the *December 16th 2011 SPC Opinion* finds: “[we]...shall adhere to the principle of eclectic interpretation for the scope of right of invention patents and utility model patents, and accurately define the scope of patent right protection.”

³⁶⁶ Among other references, see Part II, Section 2 of the *NPDS*.

³⁶⁷ Note 1: As a side note, rights-holders in China are increasingly being advised by attorneys to file for both utility model patents and invention patent protection on the same solution. This is because utility model patents are awarded much quicker than invention patents and when/if an applicant is awarded the invention patent they can just abandon the utility model for the invention patent. While certainly not the only reason this type of legal advice is heeded, in the instance that enterprises heed this type of advice not necessarily because it is an efficient and effective way to protect patents but because they feel it necessary to protect themselves against malicious patent litigation and/or bad faith filings in China, this reflects a problem with the structure of the current system. And either way, the existence of this ‘dual track’ method for patent granting will create at least somewhat of a burden for patent reviewers. While these burdens absorb at least some resources that could be spent in other areas to build-up patent quality, the solution to these concerns arguably is to reform the system without ridding it of the aforementioned ‘dual filing’ option. Note 2: Given the different nature of what they protect and the arguably lesser necessity of such models to innovation, this concern may apply less to design patents.

³⁶⁸ Measures retrieved from <http://www.sipo.gov.cn/zlsqzn/sczn2010.pdf>

“one, two, or more” pieces of *prior art* in an invention patent proceedings.³⁶⁹ While, depending on the circumstances of the utility model case, more pieces of *prior art* can theoretically be submitted, practice suggests this is by no means the usual occurrence, i.e. it is only for exceptional cases. As explained by Elliot Papageorgiou, Executive and Partner at Rouse in Shanghai, this restriction on pieces of admissible *prior art* for utility model invalidation cases makes it more difficult to invalidate utility models, as it effectively requires one or two pieces of “knock-out *prior art*” to show that the utility model has been anticipated. Papageorgiou suggests this is difficult to find unless the utility model in question merely copies a single prior registered right in its entirety and does not go beyond such right.³⁷⁰

While one could argue that it is dangerous to allow too many submissions of *prior art*, given a broad scope of solutions can be sufficiently covered by “mosaicing” individual items of *prior art*, this does not negate the fact that normally only allowing one or two pieces of *prior art* may be an unreasonably low restriction that makes it difficult to challenge utility models. As such, the requirements in the *Guidelines for Patent Examination (2010)* actually make it often more difficult to fairly determine a utility model dispute than even an invention patent dispute. This is particularly concerning when considering that, during their maintenance, a valid utility model enjoys the same powerful legal protection rights as an invention patent.³⁷¹

This situation further enables proliferation of low-quality utility model patents in particular in China. If in practice China’s enforcement system allowed (or better, required) a greater number of pieces of *prior art* to be considered by examiners in utility model invalidation proceedings, patent invalidation rates in the country would likely be higher. This supports the view that China has more low-quality patents than those gauged only by current patent invalidation rates.

III.4.1.2.3 Overly narrow consideration of *prior art* for utility models in pre-enforcement searches

In a related vein to the previously mentioned issue, sources suggest that in infringement cases SIPO’s “Patent Evaluation Report” assessing *prior art* for utility models is currently overly limited to the art in the identical technical field. With China’s technological progress, borrowing or referring to technologies in similar areas is becoming usual practice for inventors to make technological improvements. As such, not widening the range of technical fields for assessment of *prior art* on a utility model does not decrease incidence of trivial and low-quality patents in China, and may in fact enable the proliferation of such patents.³⁷² This is further compounded with the phenomenon that SIPO’s patent examiners unfortunately do not have easy access to information on the larger amount of *prior art* disclosed by use or other methods that are not part of patent litigation materials.³⁷³

³⁶⁹ Part IV, Chapter 6, Section 4, Sub-Section 2 of the *Guidelines for Patent Examination (2010)*: “... (2) Number of *prior art* references. For an invention application, one, two, or more *prior art* references can be cited to assess its inventive step. For a utility model, under normal circumstances, one or two *prior art* references can be used to assess its inventive step. Where the utility model is made by merely juxtaposing some *prior art*, the examiner may, according to the circumstance of the case, cite more than two *prior art* references to assess its inventive step.” (emphasis added) Note 1: Translation is from the European Chamber thus is unofficial. Note 2: Consultations with members of the European Chamber’s IPR Working Group suggest that pursuant to the aforementioned article, in practice up to nine pieces of *prior art* are allowed in assessing *prior art* for invention patents.

³⁷⁰ 2012, June 10- Consultations with Elliot Papageorgiou in Shanghai

³⁷¹ Ibid

³⁷² 2012, May 8- Consultations with Qu Xiaoyang, Vice Chair of the European Chamber’s IPR Working Group in Beijing

³⁷³ Gao et al. (2011), p. 81-82

III .4.1.2.4 Patent Evaluation Reports are not given appropriate weight in judicial infringement proceedings

A "Patent Evaluation Report" is the current form of the less comprehensive "Original Search Report" once used to assess the patentability of utility patents in China. The introduction of the Patent Evaluation Report in the latest revision of China's *Patent Law* (2008), was in part an attempt to address the fact that the invalidation rate of utility models in China around that time was considered high. It was suggested that the creation of an examination process similar to the Substantive Examination required for invention patents might be a constructive way of solving this problem. At present, there is an office in SIPO designated to perform these Patent Evaluation reports, staffed by several examiners transferred from the Substantive Examination Department of SIPO, who are ostensibly well-qualified to execute examinations. The Patent Evaluation Report they produce is issued after a utility model is actually granted, and is similar in several ways to an "Office Action" required during the Substantive Examination of an invention patent.³⁷⁴

Consultations suggest that in an infringement proceeding the Patent Evaluation Report for utility models is not necessarily considered as legally binding, but rather is only considered evidence, whereas although in some cases a judge may give appropriate weight to the report, in others he/she may consider such evidence along with other evidence in making a ruling or, worse, give the report very little consideration.³⁷⁵ This is significantly problematic as it undermines the expert Evaluation Report of SIPO examiners, which while facing some limitations (as discussed above) is still arguably one of the best tools assessing patentability of a utility model, in favour of different types of potentially dubious evidence in patent enforcement cases.

It is also worth pointing out that if China's adjudication system mandated more weight be given to Patent Evaluation Reports, utility model invalidation rates might be higher. This further supports the view that China has more low-quality patents than those gauged only by current invalidation rates.

³⁷⁴ An Office Action is always issued by a SIPO examiner of an invention patent application during the Substantive Examination period for that patent. In an Office Action, the examiner will perform a search to see whether they can find any documents/information that would challenge the patentability of the solution in the patent application; provide their comments regarding whether the claims in the according application are supported by the descriptions therein; determine whether the technical solutions in the descriptions are sufficiently disclosed; determine whether the draft of the claim is clear; among other elements. The patent applicant is required to respond to this report. Usually there are three to seven Office Actions during the Substantive Examination of an invention patent. (Source: 2012, February 20- Consultations with an expert at the EU IPR SME Helpdesk)

³⁷⁵ Note 1: Article 61 of the revised Patent Law states "...Where any dispute over patent infringement involves a patent for utility model or design, the people's court or the patent administrative department may require the patentee or the interested parties to present a patent assessment report issued by the patent administrative department of the State Council, after the retrieval, analysis and assessment of the pertinent utility model or design, as a proof for trying and settling the dispute over patent infringement." (LawinfoChina translation). Note 2: other translations of the law, e.g. from IPR2, are different in a way that can lead to a different interpretation of the article. The relevant selection of the Article in Chinese is "... 专利侵权纠纷涉及实用新型专利或者外观设计专利的, 人民法院或者管理专利工作的部门可以要求专利权人或者利害关系人出具由国务院专利行政部门对相关实用新型或者外观设计进行检索、分析和评价后作出的专利权评价报告, 作为审理、处理专利侵权纠纷的证据。" Note 3: 2012, March 20 consultations with Lin Xu in Shanghai suggest that herein to be "used as evidence" is different from a "binding decision." If a patent is invalidated through an invalidation procedure, this is binding in court, but if the Evaluation Report is only considered evidence by the judge then he/she may consider such evidence along with other evidence in making a ruling. In practice, the judge might consider the Evaluation Report as powerful evidence, but still this is still different from a binding decision. Note 4: A variation of this phenomenon is described in Gao et al. (2011) (p. 121), where even if an Evaluation Report for a utility model is conducted and it finds that a patent should be invalidated, SIPO may still not actively initiate an invalidation procedure on its own.

III.4.1.2.5 Lack of mandatory suspension of utility model infringement cases pending the outcome of validity proceedings

While most judges require utility model patent infringement cases in court be suspended or adjourned pending the outcome of validity proceedings at SIPO, this is not universally applied. However, this should be necessary unless the utility model patent in question has already been shown to be valid in separate/other proceedings.³⁷⁶ Such a requirement would help strengthen the perception of China's IPR protection environment, which would have spillovers in terms of further encouraging development of quality patents and related innovation.

III.4.1.2.6 Anti-monopoly Law concerns, including regulation of patent pools

There is continued uncertainty over how the *Anti-Monopoly Law* (AML), which underwent major revisions effective in August 2008, specifically Article 55³⁷⁷ which discusses regulation of monopolistic behavior based on intellectual property rights, will be implemented in practice, and this in-turn somewhat creates a drag on development of quality patents. Anti-monopoly enforcement is important in breaking-up monopoly-building resulting from certain types of patent pools (although in some circumstances patent pools can in-fact create positive impacts on patent quality³⁷⁸), related behavior stemming from the discriminatory standardisation process mentioned in Chapter 3, amongst other practices. Anti-monopoly rules are also important to monitor issues that might present themselves in implementation of a range of practices and policies (e.g. like the *2012 National IP Strategy's* plan to build up to 30 "patent alliances among burgeoning strategic industries").³⁷⁹ Herein, given the ambiguity in AML regulation of IPR at present, it is unclear how it can be used to actually appropriately regulate patent pools and other issues that can evolve into monopoly behavior and thus ultimately harm patent quality and related innovation in China.

Although they have by no means resolved the aforementioned concerns, it is worth noting that the government is continually investigating how to approach IP-related issues under the AML. For example, Part IV, Section 1 of the *NPS* states "In accordance with relevant provisions of the *Anti-monopoly Law*, we will study and actively promote the development of standards and procedures to determine whether the abuse of patent right constitutes monopolistic behavior." (See the entry in this Chapter on "abuse of patent rights" for related issues.)

III.4.1.2.7 Difficulty enforcing process patents

It is very difficult for right-holders to prove infringement of process patents (which are only granted under invention patents), and thus adequately protect such patents, given the lack of access to evidence/appropriate evidence preservation protocols in patent process cases.³⁸⁰ This said, there have been some positive developments herein, such as Article 15 of the SPC's *December 16th 2011 Opinion*, which provides further guidance to reverse the burden of proof in process patent cases.³⁸¹

³⁷⁶ 2012, May 8- Consultations with Qu Xiaoyang

³⁷⁷ Article 55 of the AML states: "This law shall not apply to the conduct of business operators to exercise their intellectual property rights according to the laws and relevant administrative regulations on intellectual property rights; however, this Law shall apply to the conduct of business operators to eliminate or restrict market competition by abusing their intellectual property rights." (translation retrieved from Lawinfochina)

³⁷⁸ Note: In some cases, patent pools may actually intensify patent competition by lowering transaction costs and facilitating the commercialisation of technologies (Source: WIPO [2011], p. 122). Patent pools also offer a potential solution to the high coordination costs of navigating patent thickets. (Source: WIPO [2011], p. 125)

³⁷⁹ Part 2, measure 14 (from SIPO and MoST): "Advance the establishment of patent alliances among burgeoning strategic industries, guide and set up 30 or so such alliances."

³⁸⁰ 2012, March 31- Consultations with Dr. Oliver Lutze in Shanghai

³⁸¹ 2012, March 23- Consultations with Doug Clark, Vice Chair of the IPR Working Group, Shanghai. Importantly, Article 61 of the *Patent Law* (2008) stipulates a reversal of burden of proof for process patents on new products.

Difficulties enforcing process patents clearly drag down patent quality, as protection of process patents is important to stimulate not just process innovation but also subsequently related product and service innovation. Further, the importance of process patent protection in China as a basis to stimulate innovations will likely grow in importance in the future.

III.4.1.2.8 Potentially overly strict limitations on granting preliminary injunctions in patent cases

Dr. Oliver Lutze, Chair of the Shanghai Chapter of the European Chamber's IPR Working Group, and Head of IPR at Bayer China, notes that Article 16 of the *December 16th 2011 SPC Opinion* may encourage reluctance in granting of preliminary injunctions (PIs) in IP cases, which could particularly harm development of quality patents in the pharmaceutical industry. The first-granted compound patents in China will expire in the next two years as compound protection was first allowed in 1993, and as such generics may increasingly enter the market prior to patent expiration. Considering Article 16 of the *December 16th 2011 SPC Opinion*, Lutze notes that:

"With a Bolar exemption and no strong patent linkage, the pharmaceutical industry may need to rely on preliminary injunctions if generics enter the market well before patent expiry. If PI's are rejected because the simple chemical analysis for determining the content of a patented compound is considered to be 'technically complex,' generics will not be estopped from sale and prices may be influenced significantly even before patent expiry. This already happens in India."³⁸²

Difficulties in obtaining a PI in patent cases in China are not only specific to the pharmaceutical sector or the abovementioned concern. While the abovementioned concern reflects a challenge to the development of quality innovations in the pharmaceutical sector in particular, they also can have a larger impact on patents and linked innovation in China in other fields if even simple technical cases are denied PIs in practice.³⁸³ Additionally, sources note the difficulty industry in China experiences in obtaining a PI before a potentially infringing good enters the market as well as the burdensome threshold for obtaining a PI.³⁸⁴

III.4.1.3 Section 4.3: Other factors

Introduction: This sub-section investigates how variety of significant factors, which while not necessarily patent-specific are closely related to patent enforcement, can somewhat stifle innovation and linked patent quality in China.

III.4.1.3.1 Lack of publication of patent case decisions

A lack of published IP decisions, including those related to patent disputes, prevents entities from fully feeling comfortable with developing and filing quality patents in China as it reinforces concerns over the lack of transparency in China's environment for enforcing IPR. Out of tens of thousands of cases decided annually, including patent cases, only a few are published in a timely manner, and some may not be published. This lack of publication of IPR cases, patent cases inclusive, conflicts

³⁸² 2012, March 31- Consultations with Dr. Oliver Lutze. Note: A Bolar exemption is an allowance in patent law that allows generic producers to conduct necessary studies, trials, and tests on products related to those already patented, whereas without this exemption these producers may otherwise run the risk of patent infringements in their conduct of clinical trials on a patented product prior to that patent's expiry.

³⁸³ 2012, March 31 - Consultations with Dr. Oliver Lutze

³⁸⁴ US Patent and Trademark Office [USPTO]. (2012). *Report on patent enforcement in China*. p. 8. Retrieved from http://www.uspto.gov/ip/global/enforcement/Report_on_Patent_Enforcement_in_China.jsp

with publication requirements in Article 63 of the *TRIPS Agreement*.³⁸⁵ Doug Clark's book *Patent Litigation in China* provides a comprehensive review of patent litigation trends in China with readily available information on the subject,³⁸⁶ but more openness is needed from the government to allow observers to further review trends in unpublished cases and assess their impact on patent quality in China.

III.4.1.3.2 Concerns surrounding non-compliance with evidence preservation orders

European Chamber members are highly concerned about the ineffectiveness of evidence preservation orders in China. In the absence of discovery, an evidence preservation order is the only avenue by which IP owners can obtain crucial evidence that is required to enforce their rights in China, e.g. in order to prove the process of manufacture for patent infringement, or to substantiate damages claims with the defendants' sales figure. IP owners would not otherwise be able to collect this type of evidence by themselves. In practice, however, defendants often refuse to co-operate with the request to produce documents even after an evidence preservation order is granted by the Court. There is limited recourse for the IP owner to deal with this situation. First, although the executing judge could invoke provisions under the *Civil Procedure Law* to impose a fine or other criminal penalties on the non-complying party, it is unclear under what circumstances such power could be or would be exercised. Second, statements signed by the defendants during evidence preservation are not provided by the court to the IP owners. This lack of transparency has prevented IP owners from investigating whether any false statements are provided by the defendants with the aim to dismiss the evidence preservation action.³⁸⁷ These problems with the enforcement environment for IP, patents inclusive, discourage patent building and related innovation in China.

III.4.1.3.3 Concerns about the PSB's acceptance of cases for criminal prosecution of IPR infringement, high thresholds for such prosecution, and too small penalties therein

A long-standing problem dragging down the development of IP in China, inclusive of quality patents, is the country's overly high value and volume thresholds to start a criminal prosecution of IPR infringement, which in effect creates a "safe harbor" for commercial-scale infringers. This conflicts with obligations under Article 61 of the *TRIPS Agreement*.³⁸⁸

Moreover, sources suggest that the Public Security Bureau (PSB)'s reluctance to acknowledge when criminal thresholds have been reached and accept cases therein is an even bigger factor inhibiting criminal prosecution of IPR infringement.³⁸⁹ This significantly undermines the ability of patent holders to properly enforce their rights.

These concerns are compounded by the often small fines and limited administrative injunctions imposed upon IPR infringers.³⁹⁰ Such fines are not significant enough deterrents for patent infringement, creating a patent enforcement environment offering weak protection that deters development of certain quality patents and related innovations otherwise encouraged by a stronger enforcement system.

³⁸⁵ European Chamber 2011/2012 Position Paper, p. 41

³⁸⁶ Clark (2011)

³⁸⁷ 2012, June 13 - Consultations with Christine Yiu, Senior Associate, Bird & Bird Shanghai

³⁸⁸ USTR. (2007). 2007 National trade estimate report on foreign barriers (p. 106). US Trade Office Representative.

Retrieved from http://www.ustr.gov/sites/default/files/uploads/reports/2007/NTE/asset_upload_file855_10945.pdf

³⁸⁹ 2012, July 14- Consultations with Elliot Papageorgiou

³⁹⁰ Ibid

III.4.1.3.4 Overly burdensome notarisation and legalisation requirements on evidence and other materials

While not exclusively related to IPR, China has set forth requirements in a variety of SPC opinions and other rules on notarisation and legalisation of evidence and other materials that are often essential in IPR cases and enforcement actions.³⁹¹ Evidence taken from outside China is required to be notarised and legalised. Notarisation and legalisation are also required on counterfeit goods at point-of-sale or at trade fairs in order to make the evidence usable. There are requirements to notarise the original trademark certificate prior to taking an enforcement action. Powers of attorney and company registration information are also required to go through a notarisation and legalisation process.

These requirements are time consuming, sometimes costly, and otherwise burdensome and arguably unnecessary. Non-Acceptance of un-notarised and un-legalised documents delays preliminary injunctions. Non-acceptance of un-notarised and un-legalised evidence limits right holders' ability to enforce IPR violations, whereas it has been reported that administrative and judicial authorities refuse to accept cases with un-notarised evidence (whereas the act of administrative and judicial processing herein is called lì'àn [立案]). Moreover, notarising and legalising the evidence and other materials mentioned herein in no way provides an attestation that these materials are accurate; rather, it only confers that the materials exist and were notarised or legalised at a certain point-in-time. Collectively, these restrictions appear to conflict with Article 41.2, 41.22, 44 and 50 of the *TRIPS Agreement*. They make it particularly difficult to adjudicate cases, which exacerbate the image of China's IPR enforcement environment, which in-turn may somewhat hamper patent quality and related innovation in China.

III.4.1.3.5 Overly burdensome requirements for acting against repeat IPR offenders at trade fairs

Patent owners are sometimes estopped from enforcement against repeat infringers due to the regulations and *de facto* practices of some local intellectual property bureaus that require, as a prerequisite before action can be taken, a decision from a prior infringement lawsuit (or in some cases, administrative action) be obtained against the repeat infringer. This is an unreasonable requirement that makes it difficult for rights holders to enforce patent rights at trade fairs. This in part enables companies to offer manufacturing of infringing products well before patent expiry, and otherwise enables patent infringement at trade fairs, which contributes to the perception that China's IPR enforcement environment is less than desirable³⁹² and thus in-effect somewhat hampers patent development and related innovation in China.

³⁹¹ For example, among others, see: Article 11 of the *Provisions of the Supreme People's Court on Evidence in Civil Procedures*; Article 11 of *Several Provisions Regarding Civil Litigation Evidence of the Supreme People's Court*; Article 27 of the *Procedures for Imposition of Administrative Punishment of Administrative Departments for Industry and Commerce*; Article 67 and 240 of the 2007 *Civil Procedure Law of the PRC*; and Article 36 of the *Notarisation Law*.

³⁹² European Chamber, IPR Working Group Position Paper 2012/2013. Note: Trade fair organisers have reportedly interpreted the *Implementing Measures for the Administration of Shanghai's Exhibition Industry* (particularly Article 7), issued by the Shanghai Intellectual Property Rights Bureau on May 23rd 2005, in a way that the fair will not accept new complaints against old targets at Shanghai fairs unless the complainant has received a final court decision against the alleged infringer. (Source: Consultations with members of the IPR Working Group, May 17th 2012. Measures retrieved from <http://www.shanghai.gov.cn/shanghai/node2314/node3124/node3164/node3172/userobject6ai1415.html>; date and promulgation authority listed at: <http://www.docin.com/p-383391561.html>).³⁹² Reports from members of the IPR Working Group find that enforcement authorities have reportedly interpreted the *Measures for Complainants and Settlements of Infringements of Intellectual Property Rights* issued during the 91st Canton Fair in 2002 by China Import and Export Fair organiser in Guangdong (the Canton Fair), particularly Article 10, in a similar fashion. (Source: 24 May 2012 - Consultations with members of the IPR Working Group; Canton Fair measures retrieved from: <http://www.cantonfair.org.cn/cn/service/ipp/detail.aspx?oid=11062>)

It is worth noting that the central-level regulation, *Protection Measures for Intellectual Property Rights During Exhibitions (“Trade Fair Protection Measures”)*, issued on January 10th 2006 by MOFCOM, SAIC, NCAC, and SIPO, provides a general regulatory framework for trade fairs.³⁹³ However, the provisions therein do not appear strict enough to sufficiently address the aforementioned concerns.³⁹⁴

III.4.1.3.6 Other enforcement concerns

A number of additional issues involving IPR enforcement, patents inclusive, in China can hamper innovation and related development of quality patents. For example, some issues not discussed at length in this study but mentioned in USPTO (2012)³⁹⁵ appear to warrant further investigation as they may not only be anecdotal.

III.4.2 Summary

There are a variety of concerning rules and procedures for patent application review and enforcement of patent rights in China that hamper patent quality. These range from inadequate review systems to requirements and practices that generally weaken the efficiency and effectiveness of the patent enforcement environment, which in-turn ultimately somewhat discourage building of quality patents and related innovation in China.

III.4.3 Recommendations

III.4.3.1 Core recommendations

III.4.3.1.1 Chapter 4 – Sub-Section 4.1

35. Recommendation: Create a taskforce to determine how the Confidentiality Review process can be reformed to still protect national security interests but also not overly burden innovators looking to register their patents abroad.

36. Recommendation: Set forth several reforms to ensure reliability and compliance with patentability requirements within the prioritised patent examination process.

36.1 Address the comments provided in the European Chamber’s Call for Comments on the *Administrative Measures on Prioritised Examination of Patent Applications submitted to SIPO on January 13th 2012*. Comments to be considered herein include concern that the measure might potentially create a less rigorous examination for patents in terms of Substantive Examinations for invention patents.

³⁹³ Retrieved from http://english.ipr.gov.cn/ipr/en/info/Article.jsp?a_no=2040&col_no=121&dir=200603

³⁹⁴ European Chamber, IPR Working Group Position Paper 2012/2013

³⁹⁵ US Patent and Trademark Office [USPTO]. (2012). *Patent enforcement in China: Summary chart of industry views*.

Retrieved from http://www.uspto.gov/ip/global/enforcement/Summary_Chart_of_Issues_and_Recommendations_9-1-11.pdf

36.2 Suggested that SIPO and MoST confirm a green channel for patent examination for strategic industries will not be applied in a discriminatory manner against otherwise qualified foreign and private domestic companies.

36.3 At least broadly clarify the meaning of Article 4 of the *Administrative Measures on the Priority Examination of Invention Patent Applications* that priority review will concentrated on “patents of great significance to national or public interests.”

36.4 A special record of prioritisation of patent applications could be disclosed regularly on the website of SIPO, including applicant name, type of application, submission date and approval date, etc.

37. Recommendation: Remove restrictions on the patentability of plants in the *Guidelines for Examination* by applying the same rationale as the European Patent Office that allows claims for patent protection of plants and plant cells where there is no overlap with plant variety protection. Furthermore, the allowable scope of patents with regard to homology claiming genetic material (like DNA) should be reviewed with a view to providing more suitable protection to the inventor.³⁹⁶

III.4.3.1.2 Chapter 4 – Sub-section 4.2

38. Recommendation: Set-up a taskforce to monitor jurisprudence from the courts to see if penalties being granted and other judgments in cases of abuse of patent rights are appropriately deterring such abuses in China. Also, null revisions to the *Patent Law* that better define and explicitly include protection against “abuse of patent rights.”

38.1 The “white-listed clauses,” “grey-listed clauses,” and “black-listed clauses” found in the *European Commission Regulation on the Application of Article 85(3) of the Treaty Establishing the European Community to Certain Categories of Technology Transfer Agreements* might serve as a model herein for defining abuse of patent rights.³⁹⁷

38.2 Also, in a parallel initiative, pursue international cooperation initiatives with the EU and other foreign institutions on regulatory and other tools to limit patent trolling.

39. Recommendation: Create better disincentives meant to discourage bad faith patent filings or otherwise infringing patents. Create better disincentives meant to discourage repeated attempts to enforce a patent filed in bad faith or an otherwise infringing patent.

39.1 For example, institute better disincentives meant to discourage the filing of “abnormal” and bad faith patents. SIPO could consider penalties for applicants filing abnormal applications (Fēi zhèngcháng zhuānlì shēnqǐn/ 非正常专利申请). Meanwhile, patentees who are found obtaining their patents in bad faith can be ordered to cover all or part of the fees related to the invalidation proceedings. And, further to the recommendations in Chapter 3 hereto, any subsidies and tax benefits the

³⁹⁶ 2012, May 8- Consultations with Dr. Oliver Lutze in Shanghai

³⁹⁷ Recommendations to use these clauses as a model to define abuse of patent rights are suggested in Gao et al. (2011), p.

wrongdoer has received for patent development and filing should be refunded to government.³⁹⁸

40. Recommendation: When an applicant has submitted more than one or two pieces of *prior art* in the course of a utility model invalidation proceeding, the PRB should be explicitly required to consider such *prior art* when assessing patentability of the utility model.³⁹⁹ This requires revising the *Guidelines for Patent Examination (2010 revision)*.

41. Recommendation: Require *prior art* is more appropriately considered in wider technical fields when conducting pre-enforcement searches for utility model patents, and better develop the mechanisms to conduct such searches.

42. Recommendation: Develop a number of tools to improve patent screening. At a minimum, seek assurances from the authorities that this area is being adequately addressed. For example, consider developing an improved patent monitoring system modeled off of the EU's EPOQUE2 and USPTO's PAIR database. The database could include details on patents pending approval or already approved (including in terms of rejections ["final" and "non-final"], appeals from the inventor, non-patent literature, accounts of the examiner's search strategy, and receipt of fees).

43. Recommendation: Mandate that Patent Evaluation Reports (for utility models) are presumed as fully valid in all court infringement proceedings and moreover are given substantial weight in such proceedings, unless, through a formal process, a judge demonstrates deviation from this requirement is necessary to appropriately adjudicate the case.

43.1 Regarding this deviation, if a judge has a strongly justifiable reason for wanting to deviate from this requirement, then a SIPO expert must at least be consulted regarding such a deviation. A formal mechanism for this exception should be established.⁴⁰⁰

44. Recommendation: Explicitly require utility model patent infringement cases be suspended or adjourned pending the outcome of validity proceedings, unless the utility model patent in question has already been shown to be valid in separate/other proceedings.

45. Recommendation: Develop appropriate guidelines on the application of the AML's Article 55 to patent pools, "patent alliances," and other IPR-related activities that may risk producing the equivalent of a monopoly. Ensure the guidelines appropriately meet the objectives of avoiding abuse of IPR and monopolistic behavior generally advocated in Part IV, Section 1, para. 2 of the *NPS*.

46. Recommendation: Enact clarifications to the adjudication rules surrounding process patents.

46.1 Request the SPC provide further guidance to assist both patentees and alleged infringers to understand how Article 15 of the *December 16th 2011 SPC Opinion* is to be applied in practice to patents.⁴⁰¹

³⁹⁸ 2012, May 8 - Consultations with Qu Xiaoyang

³⁹⁹ 2012, July 14- Consultations with Elliot Papageorgiou

⁴⁰⁰ 2012, June 11 - Consultations with Dr. Oliver Lutze

⁴⁰¹ 2012, March 23- Consultations with Paul Ranjard, Doug Clark, and Dr. Oliver Lutze

46.2 Current Chinese rules and practice governing evidence preservation in patent cases could be brought more in line with the French “Saisie contrefaçon” or German “Besichtigungsanspruch,” especially in relation to process patents.⁴⁰² A formal exchange mechanism with French and German experts could be set-up to facilitate experience sharing herein. Judges could be trained on these aforementioned principles, and other necessary topics, through mechanisms like the EUCTP STIS project or an IPR3.

47. Recommendation: Revise Article 16 of the *December 16th 2011 SPC Opinion* to clarify if circumstances where a claimed compound is easily confirmed or even mentioned as an active ingredient as part of the accused infringer’s product constitutes an infringement and therefore preliminary injunctions are obtainable.⁴⁰³ Also, develop guidance encouraging judges to grant more necessary preliminary injunctions in patent cases.

III.4.3.2 Other recommendations

III.4.3.2.1 Chapter 4 – Sub-section 4.3

48. Recommendation: Fully publish all IP disputes in a timely manner, including those related to patent disputes.

49. Recommendation: Reform the procedures surrounding treatment of non-compliance of evidence preservation orders.

49.1 Allow legal representatives from the IP owner to be present at the execution of an evidence preservation order, provided that suitable confidential undertakings are given.

49.2 Establish an appropriate protocol for the manner in which an evidence preservation order is executed (e.g. empowering the executing judge to search computer records and documents).

49.3 Provide the IP owner with a copy of the statement signed by the defendants after the execution of an evidence preservation order.

49.4 Establish a protocol that sets out the specific criteria for the judge to impose a fine or other penalty if the defendants refuse access to documents, or provide statements which are subsequently found to be false.⁴⁰⁴

50. Recommendation: Ensure that provisions relating to criminal IPR infringement are implemented, including more substantial penalties and custodial sentences, thereby actually acting as a deterrent to IPR infringement.

⁴⁰² 2012, March 31– Consultations with Dr. Oliver Lutze

⁴⁰³ 2012, March 31 – Consultations with Dr. Oliver Lutze

⁴⁰⁴ 2012, July 13 - Consultations with Christine Yiu

- 51. Recommendations: Bring China's notarisation and legalisation regime better in line with Article 41.2, 41.22, 44 and 50 of the *TRIPS Agreement* by simplifying and/or omitted the number of overly burdensome requirements in a variety of SPC opinions and other rules.**
- 52. Recommendation: Set-forth specific revisions to the *2006 Protection Measures for Intellectual Property Rights During Exhibitions*.** The measures should specify in a new article that actions against repeat infringers are allowed unless the infringer is able to justify that he/she has filed a request for declaration of non-infringement on the offered product after receiving a warning letter, or has started an invalidation proceeding against the patent in question.⁴⁰⁵

⁴⁰⁵ 2012, May 23– Consultations with Dr. Oliver Lutze

IV Conclusion

The Chinese government clearly desires to stimulate innovation in China and has already undertaken many commendable initiatives to try and improve the country's innovation system, inclusive of its patent quality situation. Still, it is essential to realise that China's patent quality problem is systemic: it goes far beyond the often cited reasons of patent filing subsidies and occasional tax incentives, having roots in a wide range of policies and other measures, as well as administrative and enforcement approaches, that do not seem to be effectively addressed at present, nor on course to be effectively addressed, and in some cases are not even discussed at all. Individually, and much more so collectively, these dulling devices create a vicious cycle which inhibits patent quality and innovation at large in China. Only when these effects are recognised to be a product of a large network of patent-related issues can China's institutional and regulatory environment for innovation be understood and systematically improved.

This study is intended as a discussion piece about certain practical ways to in the near future (as distinguished from certain changes to the educational system, culture of risk-taking, and credit system which are arguably less practical in the near term) maximise China's innovation and related patent quality potential. To be sure, it is clear that China possesses great innovation potential; however, overall, China still lags behind many developed countries in terms of innovation at large and quality patents in particular, let alone breakthrough innovation and highest-quality patents. While China may indeed be able to largely sustain its economy in the mid-term, i.e. the next five to ten years, through incremental innovation, the efficiency and effectiveness of certain policies, other measures, and practices meant to stimulate such innovation and the quality of patents produced therein deserve notable improvement. Moreover, it is clear that policymakers want to increasingly build breakthrough innovation capacity as distinct from incremental innovation, realising that in the long-term this type of innovation is essential to grow the economy. However, the efficiency and effectiveness of a variety of Chinese policies, other measures, and practices intended to stimulate breakthrough innovation and the highest-quality patents produced therein deserve serious improvement. This study attempts to flag many of these areas needing improvement and provide practical recommendations for doing so.

The European Union Chamber of Commerce in China looks forward to a productive discussion with Chinese officials on the issues and suggestions presented in this study. It is hoped that these efforts will help sharpen China's patent and larger innovation ecosystem into one that will sustainably drive its economy and provide for its people, as well as attract European businesses.

V About the European Union Chamber of Commerce in China

About the European Chamber

The European Union Chamber of Commerce in China (“European Chamber”) was founded by 51 member companies based in China on October 19th 2000. The rationale for establishing the European Chamber was based on the need of the European Union and European businesses to find a common voice across the various business sectors where they are operating in China.

The European Chamber now has a total of more than 1,700 member companies and operates from seven chapters: Beijing, Chengdu (Chengdu and Chongqing), Nanjing, Pearl River Delta (PRD) (Guangzhou and Shenzhen), Shanghai, Shenyang and Tianjin. Of these, the Shanghai Chapter is the biggest in terms of member companies, with over 600.

The European Chamber is recognised by the European Commission and the Chinese authorities as the official voice of European business in China. Its lobbying activities are maintained through the efforts of Working Groups that actively participate in the legislative process.

About the European Chamber’s IPR Working Group

The European Chamber’s IPR Working Group, which has operated for over 10 years, represents a range of European interests in lobbying for improvement of the IP regulatory and enforcement environment in China. Around half of the group’s 200 plus members are from outside the ‘professional services’ industry, for example high-end consumer product industries, whereas the remaining members are from law and consulting firms. The group holds member meetings every two months; frequently holds lobby meetings with the Chinese and European authorities on important IPR matters; provides members regular updates on relevant Chinese policy, law and regulations; provides a forum for members to share experiences and best practices; and organises and informs members about a number of IPR-related events outside the Working Group. There are Beijing and Shanghai Chapters of the group, which function as one unit and are led by one Chair and two Vice Chairs in Beijing, a co-Chair and two Vice Chairs in Shanghai, as well as an internal European Chamber staff manager/policy analyst; there is also a PRD Chapter of the group.

VI References

VI.1 Secondary sources

Amar, C., & Puech, J. (2009, July 1). Licensing essential patents in the telecoms industry. <i>Managing Intellectual Property Magazine</i> . Retrieved from http://www.managingip.com/Article/2251048/Licensing-essential-patents-in-the-telecoms-industry.html
An, S., & Peck, B. (2011). China's indigenous innovation policy in the context of its WTO obligations and commitments. <i>Georgetown Journal of International Law</i> . Retrieved March 30, 2012 from http://gjiil.org/wp-content/uploads/archives/42.2/ChinasIndigenousInnovation.pdf .
<i>Annual statistics on patent applications and patents</i> . (2012). National Board of Patents and Registration of Finland. Retrieved from http://www.prh.fi/en/patentit/Tilastoja/vuositolastot.html
Asakawa, K., & Som, A. (2008). Internationalization of R&D in China and India: conventional wisdom versus reality. <i>Asia Pacific Journal of Management</i> , Vol. 25, 375-94. http://www.springerlink.com/content/77648375721p2u28/
Atkinson, R. D. (2012, February). <i>Enough is enough: Confronting Chinese innovation mercantilism</i> . The Information Technology & Innovation Foundation [IITIF]. Retrieved from http://www2.itif.org/2012-enough-enough-chinese-mercantilism.pdf
Bai, B., & Cheng, H. (2012, February 13). Chinese Supreme Court brings about sea change for patent litigation in China. <i>Allen & Overy</i> . Retrieved from http://www.allenoverly.com/publications/en-gb/Pages/Chinese-Supreme-Court-brings-about-sea-change-for-patent-litigation-in-China.aspx
Baldwin, C. Y., & Von Hippel, E. A. (2010). <i>Modeling a paradigm shift: From producer innovation to user and open collaborative innovation</i> . Harvard Business School Finance Study, No. 10-038. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1502864
Battelle. (2011). <i>2012 global R&D funding forecast</i> . R&D Magazine. Retrieved from http://battelle.org/docs/default-document-library/2012_global_forecast.pdf?sfvrsn=2
Bessant, J., Hughes, T., & Richards, S. (2010). <i>Beyond light bulbs and pipelines: Leading and nurturing innovation in the public sector</i> . Report Commissioned by the UK Cabinet Office and Department for Business, Innovation & Skills, Sunningdale Institute.
Bleser, A., Prud'homme, D., Raihan, S., Kirkpatrick, C., Mayrand, K., Morin, J. F., Pollitt, H., Hinojosa, L., & Williams, M. (2011). <i>Trade sustainability impact assessment (SIA) on the Comprehensive Economic and Trade Agreement (CETA) between the EU and Canada: Final report</i> . European Commission Trade Assessments, pp. 289-290, 304-306. Retrieved from http://trade.ec.europa.eu/doclib/docs/2011/september/tradoc_148201.pdf
Blind, K. (2006). Chapter 5: Driving forces of patent applications at the European Patent Office: a sectoral approach. In Hingley, P., & Nicolas, M., <i>Forecasting innovations: Methods for predicting numbers of patent filings</i> , pp. 73-94. Heidelberg, Germany. Springer.
Booz and Company (2012, June 7). 2012 China Innovation Survey: Innovation- China's next advantage? <i>Booz & Company Inc</i> . Retrieved from http://www.booz.com/cn/home/41992563/41993453/50636275
Breznitz, D. (2012, May 10). Testimony of Dan Breznitz to the US-China Economic and Security Review Commission, Retrieved from http://www.uscc.gov/hearings/2012hearings/written_testimonies/12_5_10/breznitz.pdf
Breznitz, D., & Murphree, M. (2011, May). <i>Run of the red queen: Government, innovation, globalization, and economic growth in China</i> . New Haven: Yale University Press.

Breznitz, D., & Murphree, M. (2011, September). Innovation in emerging economies: China's run of the red queen. <i>World Financial Review</i> . Retrieved from http://www.worldfinancialreview.com/?p=848
Bruun, P., & Bennett, D. (2002). Transfer of technology to China: a Scandinavian and European perspective. <i>European Management Journal</i> , Vol. 20, 98-106. Retrieved from http://www.sciencedirect.com/science/article/pii/S0263237301001189
Bulgaria's national research strategy 2020. Monitoring indicators. Retrieved from http://www.mon.bg/opencms/export/sites/mon/en/top_menu/science/national_research_strategy-2020.pdf
Chan, L., & Daim, T. U. (2011). Technology transfer in China: literature review and policy implications. <i>Journal of Science and Technology Policy in China</i> , Vol. 2 Issue.2, 122 – 145. Retrieved from http://www.emeraldinsight.com/journals.htm?articleid=1942785&show=html
Chan, K. & Liu, D.F. (2012, February 13-14). <i>R&D Centres in China: Tax Incentives, Tax Planning and Related Considerations</i> . 3rd Advanced China IP Counsel Forum, Shanghai
Chen, K., & Kenney, M. (2007). Universities/research institutes and regional innovation systems: the cases of Beijing and Shenzhen. <i>World Development</i> , Vol. 35, 1056-74. Retrieved from http://www.mendeley.com/research/universitiesresearch-institutes-and-regional-innovation-systems-the-cases-of-beijing-and-shenzhen/
Chesbrough, H. (2010, November 11). China, innovation superpower: How to deal with it. <i>Forbes</i> . Retrieved from http://www.forbes.com/2010/11/11/china-innovation-globalization-leadership-managing-strategy.html
China Access4EU. <i>National funding programs in Mainland China</i> . Retrieved from http://www.access4.eu/China/274.php
China IPR (2012, April 5). <i>China boasts sharpest growth in PCT applications</i> . Retrieved from http://www.chinaipr.gov.cn/newsarticle/news/government/201204/1287307_1.html
China IPR SME Helpdesk. <i>Helpdesk ELM 3: Patents</i> [E-learning module]. Retrieved from http://www.china-iprhelpdesk.eu/en/e-learning-modules/156-helpdesk-elm-3-patents
China Law & Science Group. (2011). <i>Characteristics and practices of [sic] utility model system in China</i> .
China Patent Agent (H.K.) Ltd. (2011). <i>Newsletter 2011 Issue 2</i> . Retrieved from http://www.aipla.org/committees/committee_pages/IP_Practice_in_China/Documents/CPA%20Newsletter%202011%20Issue%202.pdf
China poised to become a global innovation leader. (2010, October 6). <i>Thomas Reuters</i> . Press Release. Retrieved from http://thomsonreuters.com/content/press_room/legal/626670
China poised to become global innovation leader. (2011, October 19). <i>Thomas Reuters</i> . Retrieved from http://thomsonreuters.com/content/news_ideas/white_papers/corporate/patented_in_china_2
China ranks 21st of its own global innovation list. (2011, February 2). <i>China Daily</i> . Retrieved from http://www.chinadaily.com.cn/china/2011-02/25/content_12075099.htm
China resolves WTO case by ending subsidies on 'famous brands'. (2009, December 20). <i>Bloomberg</i> . Retrieved from http://www.business-standard.com/india/news/china-resolves-wto-case-by-ending-subsidies%5Cfamous-brands%5C/380109/ .
China the next leader in innovation. (2010, December 7). <i>The News International</i> . Retrieved from http://www.thenews.com.pk/article-6709-China-the-next-leader-in-innovation
China Torch Program, a guiding program designed to develop new and high technology industries in China (http://168.160.200.181/eng/ejym/MainContents.htm)
China's inland provinces propose double-digit GDP targets. (2012, February 7). <i>Want China Times</i> . Retrieved from http://www.wantchinatimes.com/news-subclass-cnt.aspx?id=20120207000091&cid=1102
China's innovation capacities may be over-hyped. (2011, August 7). <i>International Business Times</i> .

Retrieved from http://www.ibtimes.com/articles/193820/20110807/china-innovation-railway-patent-education-system-academic-fraud.htm
China's patent strategy worrying foreign firms. (2011, March 22). <i>The China Post</i> . Retrieved from http://www.chinapost.com.tw/china/business/2011/03/22/295534/Chinas-patent.htm
Clark, D. (2011). <i>Patent litigation in China</i> . New York: Oxford University Press.
Cohen, W. M., & Levinthal, D. A. (1989). Innovation and learning: The two faces of R&D. <i>The Economic Journal</i> , 99, 569-596.
Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. <i>Administrative Science Quarterly</i> , Special Issue: Technology, Organizations, and Innovation, 35(1), 128-152.
Danguy, J., & Pottelsberghe, B. V. (2009). Cost-benefit analysis of the community patent. <i>Bruegel Working Paper</i> . Retrieved from http://www.bruegel.org/publications/publication-detail/publication/366-cost-benefit-analysis-of-the-community-patent/
Deloitte. (2008). <i>China tax law commentary</i> . Retrieved from http://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Documents/us_csg_chinataxlawcommentary_0808.pdf
Eberhardt, M., Helmers, C., & Yu, Z. (2011). <i>Is the Dragon learning to fly? An analysis of Chinese patent explosion</i> . Center for the Study of African Economies. Retrieved from http://www.csaee.ox.ac.uk/workingpapers/pdfs/csaee-wps-2011-15.pdf
Encaoua, D., Hall, B. H., Laisney, F., & Mairesse, J. et. (2000). <i>The economics and econometrics of innovation</i> . Dordrecht, Netherlands. Kluwer Academic Publishers.
Ernst, D. (2011). China's innovation policy is a wake-up call for America. <i>East-West Centre</i> , 8. Retrieved from http://www.eastwestcenter.org/fileadmin/stored/pdfs/api100.pdf
European Commission [EC]. <i>Guide to intellectual property rules for FP7 projects</i> (Version 3). Retrieved from ftp://ftp.cordis.europa.eu/pub/fp7/docs/ipr_en.pdf
European Commission. (2009). <i>The 2009 EU survey on R&D investment business trends</i> . Directorate General Research. Retrieved from http://iri.jrc.ec.europa.eu/research/docs/survey/2009/JRC60580.pdf
European Commission. (2010). <i>The 2010 EU survey on R&D investment business trends</i> . Directorate General Research. Retrieved from http://iri.jrc.es/research/docs/survey/2010/Survey_2010_final.pdf
European Union Chamber of Commerce in China. (2011). 2011/2012 Intellectual Property Rights (IPR) Working Group Position Paper.
European Union Chamber of Commerce in China. (2011). 2011/2012 Standards and Conformity Assessment (SCA) Working Group Position Paper.
European Union Chamber of Commerce in China IPR Working Group (2011, November 13). Response to the Call for <i>Comments on Measures for Compulsory Licensing</i> , submitted to SIPO.
European Union Chamber of Commerce in China (2012, January 13). Response to SIPO's Call for Comments on <i>Administrative Measures on Prioritised Examination of Patent Applications</i> , submitted to SIPO.
European Union Chamber of Commerce in China. (2012, 1 March). Internal document re March 5th meeting with the EC on "Prospects for the Service Sector in China."
European Union Chamber of Commerce in China. (2012, forthcoming). 2012/2013 Petrochemical, Chemical, and Refining (PCR) Working Group Position Paper.
European Union Chamber of Commerce in China. (2012, forthcoming). 2012/2013 Intellectual Property Rights (IPR) Working Group Position Paper.
Galasso, A., Schankerman, M., & Serrano, C. J. (2011). <i>Trading and enforcing patent rights</i> . Retrieved from http://www.economics.utoronto.ca/serrano/papers/GSS_paper.pdf
Gao, L., Li, M., Cheng, Y. et al. (2011, September). <i>Report on the quality for invention in China</i> . Beijing Intellectual Property Rights Institute.
Girma, S., & Gong, Y. (2008a). FDI, linkages and the efficiency of state-owned enterprises in China. <i>Journal of Development Studies</i> , Vol. 44, 728-49. Retrieved from

http://www.tandfonline.com/doi/abs/10.1080/00220380802009233
Girma, S., & Gong, Y. (2008b). Putting people first? Chinese state-owned enterprises' adjustment to globalization. <i>International Journal of Industrial Organization</i> , Vol. 26, 573-85. Retrieved from http://www.sciencedirect.com/science/article/pii/S0167718707000513
Girma, S., Gong, Y., Gorg, H., & Yu, Z. (2009). Can production subsidies explain China's export performance? Evidence from first-level data. <i>The Scandinavian Journal of Economics</i> , Issue 4, 863-891. Retrieved from http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9442.2009.01586.x/full
Giuri, P., & Torrisi, S. (2011). <i>The economic uses of patents</i> . Munich, Final Conference of the InnoS&T project "Innovative S&T indicators for empirical models and policies: Combining patent data and surveys"
Govindarajan, V., & Trimble, C. (2012). <i>Reverse innovation: Create far from home, win everywhere</i> . USA: Harvard Business Press.
Guan, Y., Mok, C., Yam, R., Chin, K., & Pun, K. (2006). Technology transfer and innovation performance: evidence from Chinese firms. <i>Technological Forecasting and Social Change</i> , Volume 73, 666-78. Retrieved from http://www.mendeley.com/research/technology-transfer-and-innovation-performance-evidence-from-chinese-firms/
Hammer, A. et al. (2011). <i>China: Effects of intellectual property infringement and indigenous innovation policies on the US Economy</i> . USITC Investigation No. 332-519, 5-29. Retrieved from http://www.usitc.gov/publications/332/pub4226.pdf
Hilty, R. M. (2009). The role of patent quality in Europe. In <i>Max Planck Institute for Intellectual Property and Competition Law Research</i> , 11 (11).
Hollanders, H., Tarantola, S., & Loschky, A. (2009). <i>Regional Innovation Scoreboard (RIS) 2009</i> . Inno Metrics.
Hu, A. G. (2008). <i>Propensity to patent, competition, and China's foreign patenting surge</i> . European Policy for Intellectual Property Conference. Retrieved from http://www.epip.eu/conferences/epip03/papers/Hu_China_patents_Hu_Sep08.pdf
Hu, A. G., & Jefferson, G. (2009). A great wall of patents: What is behind China's recent patent explosion? <i>Journal of Development Economics</i> , Vol. 90, No. 1 http://faculty.smu.edu/millimet/classes/eco6375/papers/hu%20jefferson.pdf
Hu, M. C., & Mathews, J. A. (2008). China's national innovative capacity. <i>Research Policy</i> , Volume. 37, 1465-79. Retrieved from http://nthur.lib.nthu.edu.tw/handle/987654321/61675
Innovation in China: Patents, yes; ideas, maybe. (2010, October 14). <i>The Economist</i> . Retrieved from http://www.economist.com/node/17257940
INSEAD, Alcatel- Lucent, Booz and Company, Confederation of Indian Industry, & WIPO. (2011). <i>The global innovation index 2011: Accelerating growth and development</i> . Retrieved from http://www.globalinnovationindex.org/gii/main/previous/2010-11/FullReport_10-11.pdf
INSME. (2011). <i>Technology transfer to China: Guidance for businesses</i> . Retrieved from http://insme.org/insme-newsletter/2011/file-e-allegati/newsletter_documents/Technology_transfer_to_China_FINAL.pdf
International Monetary Fund [IMF]. (2011, April). <i>World Economic Outlook Report</i> . Retrieved from http://www.imf.org/external/pubs/ft/weo/2011/01/pdf/text.pdf
Kardam, K. S. (2007). <i>Utility model – A tool for economic and technological development: A case study of Japan</i> . World Intellectual Property Organization [WIPO] and Japanese Patent Office [JPO]. Retrieved from http://www.training-jpo.go.jp/en/uploads/text_vtr/ws_pdf/kardam.pdf
Kim, L. (1997). <i>Imitation to innovation: The dynamics of Korea's technological learning</i> . Boston, MA: Harvard Business Press.
Lall, S. (2003). Indicators of the relative importance of IPRs in developing countries. <i>Research Policy</i> , 32(9), 1657-1680.
Lee, C. Y. (2011, December 21). China tops US, Japan to become top patent filer. <i>Reuters</i> . Retrieved from http://www.reuters.com/article/2011/12/21/us-china-patents-

idUSTRE7BK0LQ20111221
Lee, K., Kim, Y. K., & Park, W. G. (2006). <i>Appropriate intellectual property protection and economic growth in countries at different levels of development</i> . Retrieved from The American University, College of Arts and Sciences. Web site: http://www.american.edu/cas/faculty/wgpark/upload/Intellectual-Property-Rights.pdf
Lee, N., Nystén-Haarala, S., & Huhtilainen, L. (2010). <i>Interfacing intellectual property rights and open innovation</i> . Retrieved from http://www.wipo.int/edocs/mdocs/mdocs/en/wipo_ipr_ge_11/wipo_ipr_ge_11_topic6.pdf
Linton, K. et al. (2010). <i>China: Intellectual property infringement, indigenous innovation policies, and frameworks for measuring the effects on the U.S. economy</i> . US International Trade Commission [USITC]. Investigation No. 332-514. Retrieved from http://www.usitc.gov/publications/332/pub4199.pdf
Liu, Y. (2011, December 9). Greater convenience for foreign investors. <i>China Daily</i> . Retrieved from http://www.chinadaily.com.cn/business/10thWTO/2011-12/09/content_14240801.htm
Lohr, S. (2011, January 1). When innovation, too, is Made in China. <i>New York Times</i> . Retrieved from http://www.nytimes.com/2011/01/02/business/02unboxed.html?_r=2&partner=TOPIXNEWS&ei=5099
Lu, J. (2011, March 6). Who is making junk patents? <i>China Intellectual Property: China Daily</i> . Retrieved from http://ipr.chinadaily.com.cn/2011-03/06/content_12126586.htm
Lubman, S. (2011, July 22). Changes to China's 'indigenous innovation' policy: Don't get too excited. <i>Wall Street Journal</i> . China Real-time Report. Retrieved from http://blogs.wsj.com/chinarealtime/2011/07/22/changes-to-chinas-indigenous-innovation-policy-dont-get-too-excited/
Lutze, O., Wang, B., Xu, C., & Carnabuci, C. (2012, February 13-14). <i>Collaborative research with Chinese Universities: How to create a win-win working relationship</i> . [panel discussion]. 3rd Advanced China IP Counsel Forum, Shanghai
Managing creativity and innovation: Practical strategies to encourage creativity. (2003). <i>Harvard Business Essentials</i> . Boston, MA: Harvard Business School Publishing Corporation.
Marco, A. C. (2006, July 3). <i>The dynamics of patent citations</i> (Working Paper). Retrieved from Vassar College, Department of Economics. Web site: http://economics.vassar.edu/docs/working-papers/VCEWP84.pdf
Maskus, K. E. (2000). <i>Intellectual property rights and economic development</i> . Paper for "Beyond the Treaties: A Symposium on Compliance with International Intellectual Property Law" at Case Western Reserve University. Retrieved from University of Colorado, Department of Economics. Web site: http://www.colorado.edu/Economics/mcguire/workingpapers/cwrurev.doc
Maskus, K. E., Dougherty, S. M., & Mertha, A. (1998, September). <i>Intellectual property rights and economic development in China</i> .
Maskus, K. E., Dougherty, S. M., & Mertha, A. (2005). Intellectual property rights and economic development in China. In Fink, C., & Maskus, K. E. (Eds.) <i>Intellectual property and development: Lessons from recent economic research</i> . New York: Co-publication of World Bank, Washington D.C. and Oxford University Press. Retrieved from http://siteresources.worldbank.org/INTRANETTRADE/Resources/Pubs/IPRs-book.pdf
McDaniel, C. (1999). <i>Inventing around and impacts on modes of entry in Japan: A cross-country analysis of U.S. affiliate sales and licensing</i> . Office of Economics Study, USITC. Retrieved from http://www.usitc.gov/publications/332/working_papers/EC9911A.PDF
McGregor, J. (2010). <i>China's drive for 'indigenous innovation': A web of industrial policies</i> . US Chamber of Commerce; APCO Worldwide. Retrieved from http://www.uschamber.com/sites/default/files/reports/100728chinareport_0.pdf
National Basic Research Program [973 Program]. The implementation results of the 973 Program. In <i>Profile of the 973 Program</i> . Retrieved from http://www.973.gov.cn/English/Index.aspx
Nelson, R. R. (Ed.) (1993). <i>National innovation systems: A comparative analysis</i> . New York: Oxford

University Press.
Neuffer, J. (2011, June). <i>Statement of John Neuffer on China's Five-Year Plan, indigenous innovation and technology transfers and outsourcing</i> . Hearing before the US-China Economic and Security Review Commission. Retrieved from http://www.uscc.gov/hearings/2011hearings/transcripts/11_06_15_trans/11_06_15_final_transcript.pdf
NSD Bio Group. (2009). <i>Research report on Chinese high-tech industries. US China Economic and Security Review Commission</i> . Retrieved from http://www.uscc.gov/researchpapers/2009/Research_Report_on_Chinese_High_Tech_Industries.pdf
Ockenden, J. (2011, December 5). China must boost patent quality, protection and use, says IP boss. <i>Blueskies China</i> . Retrieved from http://blueskieschina.com/mambo/content/view/303/86/
Odagiri, H., Goto, A., Sunami, A., & Nelson, R. R. (2010). <i>Intellectual property rights, development, and catch up: An international comparative study</i> . Oxford University Press. Retrieved from http://www.oup.com/us/catalog/general/subject/Economics/Developmental/?view=usa&ci=9780199574759
OECD. (2007). <i>Reviews of Innovation Policy</i> . Organisation for Economic Co-operation and Development. Retrieved from http://www.oecd.org/science/innovationinsciencetechnologyandindustry/oecdreviewsofinnovationpolicy.htm
OECD. (2011). <i>Competing in the global economy, technology performance: Quality</i> . In OECD Science, Technology and Industry Scoreboard. Retrieved from http://www.oecd-ilibrary.org/sites/sti_scoreboard-2011-en/06/13/index.html?contentType=/ns/Book,/ns/StatisticalPublication&itemId=/content/book/sti_scoreboard-2011-en&containerItemId=/content/serial/20725345&accessItemIds=&mimeType=text/html
OECD. (2011b). <i>OECD science, technology and industry scoreboard 2011</i> . OECD Publishing. Retrieved from http://dx.doi.org/10.1787/sti_scoreboard-2011-en
OECD. <i>OECD Stats: Concepts & classifications, key statistical concept</i> . Retrieved from http://stats.oecd.org/oecdstat_metadata/ShowMetadata.ashx?Dataset=PATS_IPC&Coords=&Lang=en
Orrick. (2010, January). <i>China income tax preferences for high/new-tech enterprises (HNTE)</i> . Orrick Tax Law Update. Retrieved from http://www.orrick.com/fileupload/2420.pdf
Prud'homme, D. (2012, forthcoming). <i>The biggest subsidy scheme nobody's heard of: China's Central Foreign Trade Development Fund</i> . European Chamber Working Paper.
Recognition of hi-tech enterprises (http://www.innocom.gov.cn/web/)
Richards, J. (2010). <i>Utility model protection throughout the world</i> . Intellectual Property Owner's Association. Retrieved from http://www.ipo.org/AM/Template.cfm?Template=/CM/ContentDisplay.cfm&ContentID=25244
Roth, E. (2012) PowerPoint Presentation for European Chamber's May 17th 2012 R&D Conference in Shanghai
Scellato, G., Calderini, M., Caviggioli, F., Franzoni, C., Ughetto, E., Kica, E., & Rodriguez, V. (2011). <i>Study on the quality of the patent system in Europe</i> . European Commission. Retrieved from http://ec.europa.eu/internal_market/indprop/docs/patent/patqual02032011_en.pdf
Schumpeter, J. (1942). <i>Capitalism, socialism, and democracy</i> . New York: Harper & Brothers.
Serger, S. <i>Foreign R&D centres in China: development, drivers, spillovers</i> . Swedish Institute for Growth Policy Studiesm. University of Lund. [Presentation]. Retrieved from http://www.oecd.org/dataoecd/18/16/39244157.pdf
Shandong Institute of Internal Audits. (2005, November 4). <i>Audit shows the disadvantages of Foreign Trade Funds</i> . Beijing News. Retrieved from

http://www.sdiia.gov.cn/yznews/showdetail.apx?id=4543
Sherman, E. (2009). Patent life spans shorter than law allows. <i>CBS News</i> . Retrieved from http://www.cbsnews.com/8301-505124_162-43440508/patent-life-spans-shorter-than-law-allows/
SIPO: Quality, not numbers, key to patents and innovation. (2011, January 5). <i>China Daily</i> . Retrieved from http://www.chinadaily.com.cn/cndy/2011-01/05/content_11794970.htm
SIPO. (2010) <i>Annual Report: Chapter IV: Patent Application and Examination</i> , http://english.sipo.gov.cn/laws/annualreports/2010/201104/P020110420372588586402.pdf
SIPO. (2011, May 29th). Great progress made on protecting intellectual property right in Xizang Autonomous Region. <i>Intellectual Property Newspaper</i> . Retrieved from http://www.sipo.gov.cn/mtjj/2011/201105/t20110526_605517.html
SIPO. (2012, June 19). <i>SIPO issues the report on overall patent strength</i> . Retrieved from http://english.sipo.gov.cn/news/official/201206/t20120619_711414.html .
SIPO. (2011, January 25). <i>Grants for three kinds of patents received from home and abroad (January 2010-December. 2010)</i> . A SIPO Statistics. Retrieved from http://english.sipo.gov.cn/statistics/gnwsqnb/2010/201101/t20110125_570600.html
SIPO. (2011, January 25). <i>Total applications for three kinds of patents received from home and abroad (May 1985-December 2010)</i> . A SIPO Statistics. Retrieved from http://english.sipo.gov.cn/statistics/
SIPO, & Peking University Intellectual Property Institute. (2005, October 31). <i>Study on major IPR cases with external dimensions since China joined the WTO</i> . Retrieved from http://stlaw.pku.edu.cn/UploadFiles/200941714515938.doc
<i>Statistics on Valid Patents in China by 2010</i> . (2011, April 25). China Science Patent & Trademark Agent Ltd. [CSPTAL] Newsletter, Retrieved from http://www.csptal.com/upload/CSPTAL%20newsletter%20on%20valid%20patent%20201104%20en.pdf
Stembridge, B. (2011). <i>Chinese patenting: Report on the current state of innovation in China</i> . Thomson Reuters. Retrieved from http://ip.thomsonreuters.com/
Stewart, T. (2007). <i>China's industrial subsidies study: High technology</i> . Trade Lawyers Advisory Group. Retrieved from http://www.uscc.gov/researchpapers/2008/TLAG%20Study%20-%20China%27s%20Industrial%20Subsidies%20High%20Technology.pdf
Sun, H. (2004). Post-grant patent invalidation in China and in the United States, Europe, and Japan: A Comparative Study. <i>Fordham Intellectual Property, Media and Entertainment Law Journal</i> .
Suthersanen, U. (2006). <i>Utility models and innovation in developing countries</i> . (UNCTAD Project on IPRs and Sustainable Development, Issue paper No.13). United Nations Conference on Trade and Development. Retrieved from http://www.unctad.org/en/docs/iteipc20066_en.pdf
Testimony of Dan Breznitz to the US-China Economic and Security Review Commission. (2012, May10). Retrieved from http://www.uscc.gov/hearings/2012hearings/written_testimonies/12_5_10/breznitz.pdf
The contrasting relationship between independent intellectual property rights and non-independent intellectual property rights. (2011). <i>Zhonggu Law Online</i> . Retrieved from http://news.9ask.cn/zclaw/zczs/smzc/201105/1210223.shtml
The patent quality challenge facing China and its businesses. (2011, January 20). <i>Intellectual Asset Management Magazine</i> . Retrieved from http://www.iam-magazine.com/issues/article.ashx?g=64724577-cf28-4cb1-bad6-c012264ee060
The quality patent challenge facing China and its businesses. (2011, January 20). <i>IAM Magazine</i> . Retrieved from http://www.iam-magazine.com/issues/article.ashx?g=64724577-cf28-4cb1-bad6-c012264ee060
Thirty provinces lower GDP growth target. (2012, February 23). <i>China Daily</i> . Retrieved from http://www.chinadaily.com.cn/business/2012-02/23/content_14679318.htm
Torch Hi-tech Industry Development Center of MoST (http://www.chinatorch.gov.cn/index.html)

US Patent and Trademark Office [USPTO]. (2012). <i>Patent enforcement in China: Summary chart of industry views</i> . Retrieved from http://www.uspto.gov/ip/global/enforcement/Summary_Chart_of_Issues_and_Recommendations_9-1-11.pdf
US Patent and Trademark Office [USPTO]. (2012). <i>Report on patent enforcement in China</i> . Retrieved from http://www.uspto.gov/ip/global/enforcement/Report_on_Patent_Enforcement_in_China.jsp
US-China Business Council [USCBC]. (2011, March). <i>Issues brief: China's domestic innovation and Government procurement policies</i> . Retrieved from https://www.uschina.org/public/documents/2011/innovation_procurement_brief.pdf
USTR. (2007). <i>2007 National trade estimate report on foreign barriers</i> . US Trade Office Representative. Retrieved from http://www.ustr.gov/sites/default/files/uploads/reports/2007/NTE/asset_upload_file855_10945.pdf
USTR. (2011). <i>2011 National trade estimate report on foreign trade barriers: China</i> . United States Trade Representative. Retrieved from http://www.ustr.gov/webfm_send/2694
Vaitheeswaran, V. V. (2012). <i>Need, speed, and greed: How the new rules of innovation can transform businesses, propel nations to greatness, and tame the World's most wicked problems</i> . New York, NY: Harper Collins.
Wagner, P. R. (2009). <i>Understanding patent quality mechanisms</i> . Federal Trade Commission. Retrieved from http://www.ftc.gov/bc/workshops/ipmarketplace/apr17/docs/rwagner2.pdf http://www.ftc.gov/bc/workshops/ipmarketplace/apr17/docs/rwagner2.pdf
Wang, B. (2012, February 13-14). <i>Working with Chinese Universities – IP issues in agreements</i> . [Presentation]. 3rd Advanced China IP Counsel Forum, Shanghai
Wild J. (2011, January). Quality is China's biggest patent challenge. <i>Intellectual Assessment Management</i> . Retrieved from http://www.iam-magazine.com/blog/Detail.aspx?g=e81c5421-bccc-4eb5-9895-f347443cf73e
Wilding, J. (2010). <i>Statistics for EPO oppositions and appeals – Update</i> . HLBShaw Ltd. Retrieved from http://www.hlbshaw.com/uploads/files/20100716115959_8523.pdf
WIPO. (2012, March 5). <i>International Patent Filings Set New Record in 2011</i> . Retrieved from http://www.wipo.int/pressroom/en/articles/2012/article_0001.html
Wolf, A. (2011, May). Alan Wolff's testimony on "China's Indigenous Innovation Policy". Hearing before the US-China Economic and Security Review Commission. Retrieved from http://www.uscc.gov/hearings/2011hearings/written_testimonies/11_05_04_wrt/11_05_04_wolff_testimony.pdf
World Bank. (2001). <i>Intellectual property: Balancing incentives with competitive access</i> . Global Economic Prospects. Washington, D.C.: World Bank, 129-150.
World bank. (2012). <i>China 2030: Building a modern, harmonious, and creative high-income society</i> . Retrieved from http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2012/02/28/000356161_20120228001303/Rendered/PDF/671790WPOP127500China020300complete.pdf
World Economic Forum. (2011). <i>Global competitiveness report 2011-2012</i> . Retrieved from www3.weforum.org/docs/WEF_GCR_Report_2011-12.pdf
World Intellectual Property Organization [WIPO]. (2011). <i>World Intellectual Property Report</i> . Retrieved from http://www.wipo.int/freepublications/en/intproperty/944/wipo_pub_944_2011.pdf
WTO. (2009, January 7). <i>China – Grants, loans and other incentives: Request for consultations by the United States</i> . WT/DS387/1. (Document No 09-0022, pp. 1-18). Retrieved from http://docsonline.wto.org
Wu, J., & Pangarkar, N. (2006). Rising to the global challenge: strategies for firms in emerging

markets. <i>Long Range Planning</i> , Vol. 39, 295-313. Retrieved from http://people.bath.ac.uk/mnsipc/Reading/Asian%20corporations/Chinese%20articles/local%20Ostrat.pdf
Xu, H. (2011). <i>China IP policy research and national IP policy requirement</i> . [Presentation]. SIPO. Retrieved from http://www.unescap.org/tid/projects/ipep-cn.pdf
Yeo, V. (2011, September 30). Public policy aids tech innovation but not silver bullet. <i>ZDNet News</i> . Retrieved from http://www.zdnetasia.com/public-policy-aids-tech-innovation-but-not-silver-bullet-62302301.htm
Yu, T.F.-L. (1998). Adaptive entrepreneurship and the economic development of Hong Kong. <i>World Development</i> , 26(5), 897-911.
Zheng, L., & Lan, X. (2009). A tale of two cities: A comparison of patent-based innovative performance of domestic and multinational companies in China. In Proceedings of the Joint Symposium of US-China Advanced Technology Trade and Industrial Development. <i>Journal of International Commerce & Economics</i> , 3(1). Retrieved from http://www.usitc.gov/journals/entire_journal_2010_11_4.pdf
Zhong, X., & Yang, X. (2007). Science and technology policy reform and its impact on China's national innovation system. <i>Technology in Society</i> , Vol. 29, 317-25.
Zhou, E. Y., & Stemberge B. (2010). Patented in China II: The present and future state of innovation in China. <i>Thomson Reuters</i> . Retrieved from http://ip.thomsonreuters.com/content/patented-china-ii

VI.2 Consultations

2011, October 28- Meeting with SIPO Commissioner Tian Lipu, other senior SIPO officials, and European Chamber representatives
2012, January 19- Consultations with a member of the European Chamber
2012, January 19- Consultations with members of the European Chamber
2012, February 15- Consultations with several professional services' consultants in Shanghai
2012, February 20- Consultations with an expert at the EU IPR SME Helpdesk
2012, March 6- Consultations in Shanghai with several R&D managers of large multinational companies involved in the European Chamber
2012, March 13- Consultations with several European Chamber members in Shanghai
2012, March 15- Consultations with Dr. Oliver Lutze, Co-Chair of the European Chamber's IPR Working Group & IPR Working Group Chair in Shanghai, in Shanghai
2012, March 16- Consultations with Dr. Oliver Lutze in Shanghai
2012, March 20- Consultations with Vice Chair of the European Chamber's IPR Working Group in Shanghai and Associate at Taylor Wessing, in Shanghai
2012, March 23- Consultations on SMEs' internationalisation in China with a DG Enterprise representative
2012, March 23- Consultations with Paul Ranjard, Chair of the European Chamber's Working Group in Beijing; Doug Clark, Vice Chair of the European Chamber's Working Group in Shanghai; and Dr. Oliver Lutze
2012, March 31- Consultations with Dr. Oliver Lutze in Shanghai
2012, April 17- Consultations with several members of the European Chamber in Shanghai
2012, April 12, 18- Consultations with several Chinese companies in the nutrition and machinery industries
2012, April 18- Consultations with Dr. Oliver Lutze in Shanghai
2012, April 24- Consultations with Lin Xu in Shanghai

2012, April 25- Consultations with certain Chinese R&D managers, Shanghai
2012, May 7- Consultations with Lin Xu in Shanghai
2012, May 8- Consultations with Qu Xiaoyang, Vice Chair of the European Chamber's IPR Working Group in Beijing
2012, May 8- Consultations with Dr. Oliver Lutze in Shanghai
2012, May 9- Consultations with several members of the European Chamber
2012, May 9- Consultations with Dr. Oliver Lutze in Shanghai
2012, May 14- Consultations with a representative in the telecom industry in the Chamber's IPR Working Group
2012, May 15- Consultations with members of the European Chamber in Shanghai
2012, May 17- Consultations with several members of the European Chamber's R&D Forum
2012, May 17- Consultations with members of the IPR Working Group
2012, May 17- Consultations with Lin Xu
2012, May 23- Consultations with Dr. Oliver Lutze in Shanghai
2012, May 24- Consultations with members of the IPR Working Group
2012, June 11- Consultations with Dr. Oliver Lutze in Shanghai
2012, June 12- Consultations with Elliot Papageorgiou, Executive & Partner at Rouse Legal (China), in Shanghai
2012, June 13- Consultations with Christine Yiu, Senior Associate, Bird & Bird, in Shanghai
2012, June 15- Consultations with a patent attorney based in the US
2012, June 27- Consultations with members of different working groups of the European Chamber
2012, July 10- Consultations with Elliot Papageorgiou in Shanghai
2012, July 12- Consultations with Elliot Papageorgiou in Shanghai
2012, July 13- Consultations with Christine Yiu in Shanghai
2012, July 14- Consultations in Shanghai with a member of the European Chamber
2012, July 14- Consultations with Elliot Papageorgiou in Shanghai
2012, August 2- Consultations with a member of the European Chamber in Shanghai
2012, August 2, 3, and 8- Consultations with three individuals, one based in Beijing and the other two based in Shanghai
2012, August 9- Consultations (via phone) with SIPO

VI.3 Laws, policies, other measures, and court opinions

Anhui Intellectual Property Office. (2011, November 17). <i>Anhui's 12th Five Year Plan on intellectual property (patent) development</i> . Retrieved from http://www.ahipo.gov.cn/dt2111111175.asp?DocID=2111116610
Beijing Intellectual Property Bureau, & Beijing Development and Reform Commission. (2011, August 24). <i>Notice on launching Beijing's 12th Five Year Plan on intellectual property (patent) development</i> . Retrieved from http://www.bjipo.gov.cn/zcfg/zlgh/201202/t20120207_25714.html
Beijing MoF, & Beijing Municipal Bureau of Quality and Technical Supervision. (2006, November 13). <i>Beijing administrative measures of the special subsidiary funds for the formulation (revision) of technology standards</i> . Retrieved from http://www.bjtsb.gov.cn/infoview.asp?ViewID=2711
Beijing People's Government. (2009, May 6). <i>Advices on implementation of Beijing intellectual property strategy compendium</i> . Retrieved from http://www.gov.cn/gzdt/2009-05/06/content_1305629.htm
Canton Fair. (2002). <i>Measures for complainants and settlements of infringements of intellectual property rights</i> . Retrieved from http://www.cantonfair.org.cn/cn/service/ipp/detail.aspx?oid=11062
Chengdu High-Tech Industrial Development Zone [CDHT]. <i>Investing in China – Government policies</i> . Retrieved from http://www.chengduhitech.co.uk/Guide/Government_Policies.asp
<i>Chint vs. Schneider on patent infringement</i>
Chongqing Legislative Affairs Office. (2011, November 30). <i>A State Council notice directing all government entities to remove any mention of linkages between indigenous innovation policy and government procurement within regulatory documents</i> . Retrieved from http://www.cqfzb.gov.cn/Pro_General/ContentShow.aspx?ProID=49&myid=8655
Chongqing Municipal People's Government. (2011, October 27). <i>Chongqing's 12th Five Year Plan on intellectual property (patent) development</i> . Retrieved from http://www.cqipo.gov.cn/templet/default/ShowArticle.jsp?id=5421
<i>Criminal Law of the P.R.C</i>
Department of Foreign Trade and Economic Cooperation of Guangdong Province, & Department of Finance of Guangdong Province. (2011, June 14). <i>Notice on good performance of the construction fund for Guangdong export bases of agricultural, light industry and textile products for the year of 2011</i> . Retrieved from http://www.gddoftec.gov.cn/admin/UploadFile/2011621161019379.pdf
Department of Science and Technology in Shanxi. (2009, August 13). <i>Launch drafting Shanxi intellectual property strategy compendium</i> . Retrieved from http://www.shanxigov.cn/n16/n1611/n3539/n7299/n20244/8365727.html
Development and Reform Commission of Guangxi Zhuangzu Autonomous Region, & Science and Technology Office of Guangxi Zhuangzu Autonomous Region. (2011, August 8). <i>Guangxi Zhuangzu autonomous region's 12th Five Year Plan on science and technology development</i> . Retrieved from http://gov.gxsti.net/zwgk/zxtz/613832.shtml
European Community, & Government of the PRC. (2000, January 11). <i>Agreement for scientific and technological cooperation between the European Community and the government of the People's Republic of China</i> . Official Journal of the European Communities. Retrieved from http://ec.europa.eu/world/agreements/downloadFile.do?fullText=yes&treatyTransId=784
Fourth Plenary Session of the Fifteenth Central Committee of Communist Party of China. (1999, September 22). <i>Decision of the Central Committee of the Communist Party of China on major issues concerning the reform and development of state-owned enterprises</i> . Retrieved from http://cpc.people.com.cn/GB/64162/71380/71382/71386/4837883.html

Fujian Province People's Government. (2010, January 30). <i>Advices on implementation of national intellectual property strategy compendium</i> . Retrieved from http://baike.baidu.com/view/3357924.htm
Gansu Intellectual Property Office. (2011, March 22). <i>Gansu's 12th Five Year Plan on intellectual property (patent) development</i> . Retrieved from http://www.gsipo.gov.cn/zcfg/detail.php?n_no=38287&dir=%D5%FE%B2%DF%B7%A8%B9%E6/%C6%E4%CB%FB
Gansu Prisons Bureau, & Gansu Intellectual Property Department. (2009, October 1). <i>Measures for the rewards and recognition of the invention, creation and technical innovation of prisoners within the period of execution (trial)</i> . Retrieved from http://www.sipo.gov.cn/mtjj/2009/200908/t20090803_471159.html
Gansu Province People's Government. (2010, June 18). <i>Notice on launching Gansu intellectual property strategy compendium</i> . Retrieved from http://www.gsipo.gov.cn/zscqzl/detail.php?n_no=36798
Government of Xinjiang Uygur Autonomous Region. (2010, April 19). <i>Notice on launching intellectual property strategy compendium of Xinjiang Uygur autonomous region</i> . Retrieved from http://www.akss.gov.cn/childsite/kjj/index.php?option=com_content&view=article&id=360:2010-05-10-09-03-45&catid=46:2009-04-21-01-31-28&Itemid=77
Guangdong Intellectual Property Office. (2012, March 27). <i>Intellectual property strategy compendium of Guangdong province (2007-2020)</i> . Retrieved from http://www.sipo.gov.cn/twzb/gdyjbkbys/bjzl/201203/t20120327_659900.html
Guangdong Province People's Government. (2011, August 10). <i>Guangdong's 12th Five Year Plan on intellectual property (patent) development</i> . Retrieved from http://zwgk.gd.gov.cn/006939748/201108/t20110823_269558.html
Guangdong Provincial People's Congress. (2010, February 29). <i>News conference on promulgation and implementation of provincial independent innovation regulations</i> . Retrieved from http://www.npc.gov.cn/npc/xinwen/dfrd/guangdong/2012-02/29/content_1693676.htm
Guangxi Zhuangzu Autonomous Region People's Government. (2009, December 23). <i>Notice of advices on launching Guangxi Zhuangzu autonomous region intellectual property strategy compendium</i> . Retrieved from http://www.gxipo.net/zcfg/zt/554850.shtml
Guizhou Intellectual Property Office. (2009, February 14). <i>Intellectual property strategy compendium of Guizhou province (2006-2015)</i> . Retrieved from http://www.jsip.gov.cn/news/ztbd/ztbdcs/ztbdpd9/200902/20090214_51568.html
Guizhou Intellectual Property Office. (2011, October 13). <i>Guizhou's 12th Five Year Plan on intellectual property (patent) development</i> . Retrieved from http://www.chinagzpp.cn/Article/ShowArticle.asp?ArticleID=1110
Guo Ke Fa Huo, (2008, No 172). MOST, MoF, & SAT. (2008, April 14). <i>Key high-tech fields with state support</i> . Retrieved from http://www.wjkc.gov.cn/E_ReadNews.asp?NewsID=485
Hainan Intellectual Property Office. (2010, July 6). <i>Intellectual property strategy compendium of Hainan province</i> . Retrieved from http://www.hipo.gov.cn/list.asp?id=2883
Hainan Intellectual Property Office. (2011, December 27). <i>Hainan's 12th Five Year Plan on patent development</i> . Retrieved from http://www.hipo.gov.cn/list.asp?id=3165
Hebei Intellectual Property Office. (2011, June 10). <i>Hebei's 12th Five Year Plan on patent development</i> . Retrieved from http://218.12.44.17/content.jsp?code=40170382-3/2011-00104&name
Hebei Province People's Government. (2009, June 22). <i>Advices on implementation of National intellectual property strategy compendium</i> . Retrieved from http://2010.hebstd.gov.cn/?thread-64-1.html
Heilongjiang Province People's Government. (2011, May 22). <i>Notice on launching Heilongjiang intellectual property strategy compendium (2011-2020)</i> . Retrieved from http://baike.baidu.com/view/7153606.htm

Henan Intellectual Property Office. (2008, November 23). <i>Intellectual property strategy compendium of Henan province</i> . Retrieved from http://www.hnpatent.gov.cn/patentwebsite/show.do?method=show&id=3577
Henan Intellectual Property Office. (2010, December 20). <i>Henan's 12th Five Year Plan on intellectual property development</i> . Retrieved from http://hnszscqzlw.cn/ArticleShow.asp?id=89
Hubei Intellectual Property Bureau. (2011, July 29). <i>Hubei's 12th Five Year Plan on intellectual property (patent) development</i> . Retrieved from http://www.hbipo.gov.cn/upfile/20100729011527652.doc
Hubei Province People's Government. (2010, August 11). <i>Intellectual Property strategy compendium of Hubei province</i> . Retrieved from http://www.xinhuanet.com/chinanews/2010-08/25/content_20711850.htm
Hunan Intellectual Property Office, & Development and Reform Commission of Hunan Province. (2012, May 7). <i>Hunan's 12th Five Year Plan on patent development</i> . Retrieved from http://www.sipo.gov.cn/dtxx/zlgzdt/2012/201205/t20120507_687187.html
Hunan Province People's Government. (2010, March 27). <i>Intellectual Property strategy compendium of Hunan province</i> . Retrieved from http://news.163.com/09/0327/11/55DK0BOK000120GU.html
Intellectual Property Office of Jiangsu Province. (2011, November 2). <i>Jiangsu's 12th Five Year Plan on patent development</i> . Retrieved from http://www.jsip.gov.cn/laws/bmgfxwj/201112/20111216_70465.html
Intellectual Property Office of Jiangxi Province. (2011, April 6). <i>Call for comments on Jiangxi province intellectual property strategy compendium</i> . Retrieved from http://zl.ncinfo.gov.cn/readnews.asp?id=2292
Intellectual Property Office of Liaoning. (2011, November 15). <i>Liaoning's 12th Five Year Plan on patent development</i> . Retrieved from http://www.lnipo.gov.cn/zscqjweb/zsweb/informationShow.jsp?sectorId=yewgh&infolD=bb45458632fb1d2c0133a58bdb5901b8
Intellectual Property Office of Yunnan Province. (2011, March 24). <i>Yunnan's 12th Five Year Plan on intellectual property (patent) development</i> . Retrieved from http://www.ynipo.gov.cn/newsview.aspx?id=3074
Intellectual Property's Office of Liaoning. (2011, June 8). <i>Intellectual Property strategy compendium of Liaoning province</i> . Retrieved from http://www.lnipo.gov.cn/zscqjweb/zsweb/informationShow.jsp?sectorId=zscqzlgly&infolD=bb4545863068d15001306d2df5070046
International Union for the Protection of New Variety of Plants [UPOV]. (1991). <i>International convention for the protection of new varieties of plans [UPOV '91 version']</i> . Retrieved from http://www.upov.int/en/publications/conventions/1991/act1991.htm
Jiang, Z. <i>China's Intellectual Property Rights Protection in 2000</i> . Retrieved from http://www.lawinfochina.com/display.aspx?lib=dbref&id=94
Jiangsu Province People's Government. (2009, January 5). <i>Notice on launching intellectual property strategy compendium of Jiangsu province</i> . Retrieved by from http://www.jsip.gov.cn/news/ywdtnews/200901/20090112_50874.html
Jinan Municipal Intellectual Property Office. (2012, March 6). <i>2012 Jinan standards on financial support for patents</i> . Retrieved from http://pss-system.gov.cn/sipopublicsearch/portal/showContentDetailAC!showContentDetail.do?wee.bizlog.modulelevel=0100103&contentId=97cf5d82782840769b33880b34a6ec94&catalogIdForNV=law
Joint Meeting on the Employment of Shanghai College Graduates (2012, May). <i>2012 grading policy for non-Shanghainese college graduates of obtaining employment in Shanghai</i> . Retrieved from http://life.sjtu.edu.cn/index.php?option=com_content&view=article&id=538:2012&catid=135&Itemid=229

Liaoning Province Department of Finance, & Liaoning Province Department of Science and Technology. (2009, August 29) <i>Liaoning province indigenous innovation product accreditation management rules (provisional)</i> . Retrieved from http://www.lninfo.gov.cn/kjzx/show.php?itemid=11867
MIIT. (2005, January 28). <i>Opinion on accelerating the large company strategy in the electronics and information industry</i> . Retrieved from http://www.chinabaike.com/law/zy/bw/gw/xcb/1355307_2.html
MIIT. (2009, September 18). <i>MIIT's report for the 60th anniversary of the PRC</i> . Retrieved on August 15, 2012 from http://www.miit.gov.cn/n11293472/n11293877/n12511031/n12511106/12693827.html
MIIT, MoST, MoF, & SASAC. (2012, February 22). <i>Indigenous innovation guidance catalogue of large technical equipment</i> . Retrieved from http://www.miit.gov.cn/n11293472/n11293832/n12843926/n13917042/14471328.html
MoF, & Ministry of Foreign Trade and Economic Cooperation [MOFTEC]. (2001, November 27). <i>Administrative measures for research and development fund of export products</i> . Retrieved from http://www.zwgk.suzhou.gov.cn/dpt/show.asp?ID=18598
MoF. (2009, September 15). <i>Provisional measures on the administration of special patent funds for subsidizing filing patents abroad</i> .
MoF. (2012, April 14). <i>Administrative measures on special funds for subsidizing foreign patent applications</i> . Retrieved from http://jjs.mof.gov.cn/zhengwuxinxi/zhengcefagui/201205/t20120531_655657.html
MOFCOM, & MoF. (2007, September 3). <i>Application guidance for fund for the optimisation of import & export of machinery & electrical product and high tech products</i> . Retrieved from http://www.smes-tp.com/Article_Show.asp?ArticleID=32448
MOFCOM, NDRC, MoST, MoF, MIIT, the People's Bank of China [PboC], General Administration of Customs [GAC], State Administration of Taxation (SAT), & General Administration of Quality Supervision, Inspection and Quarantine [AQSIQ]. (2006, May 27). <i>Opinions on accelerating the transformation of the export growth of electromechanical products within the period of Eleventh Five Year</i> . Retrieved from http://www.mofcom.gov.cn/aarticle/difang/ningxia/200609/20060903039965.html
MOFCOM, SAIC, NCAC, & SIPO. (2006, January 10). <i>Protection measures for intellectual property rights during exhibitions (trade fair protection measures)</i> . Retrieved from http://tradeinservices.mofcom.gov.cn/en/b/2006-01-10/7876.shtml
MOFCOM. (2006, December 31). <i>Trial measures for the administration of the accreditation of national indigenous innovation products</i> . Retrieved from http://big5.mofcom.gov.cn/gate/big5/im.mofcom.gov.cn/aarticle/subject/zsjm/localcc/201012/20101207305384.html
MOFCOM. (2009, February 1). <i>Measures of the administration of technology import and export contracts registration, [decree No. 3, 2009]</i> . Retrieved from http://www.gov.cn/flfg/2009-02/04/content_1221640.htm
MOFTEC. (2001, December 30). <i>Measures for the administration of technology import and export contracts registration, [Decree No. 17, 2001]</i> . Retrieved from http://www.lawinfochina.com/Display.aspx?lib=law&Cgid=38067
MOST, & MoF. (1999, May 21). <i>The regulations on the innovation fund for small technology-based firms (provisional)</i> . Retrieved from http://www.innofund.gov.cn/innofile/se_02.asp
MOST, MoF, & SAT (2008, July 8). <i>Working guidance on the recognition of hi-tech enterprises</i> . Retrieved from http://www.most.gov.cn/gxjscopykfq/wj/200810/t20081029_64626.htm
MOST, MoF, & SAT. (2008, April 14). <i>Administrative measures for the recognition of hi-tech enterprise</i> . Retrieved from http://www.gov.cn/zwgk/2008-04/24/content_953215.htm
MOST, NDRC, & MoF. (2007). <i>Hebei Province indigenous innovation product accreditation management rules (provisional)</i> . Retrieved from

http://www.tsdr.gov.cn/a/xinxigongkai/gaoxinjishu/2010/0308/1798.html
MOST, NDRC, & MOF. (2011, July 4). <i>Notice on voiding “trial measures for the administration of the accreditation of national indigenous products (2006)”</i> . Retrieved from http://www.jskw.gov.cn/FileUpload/%E5%85%B3%E4%BA%8E%E5%81%9C%E6%AD%A2%E6%89%A7%E8%A1%8C%E3%80%8A%E5%9B%BD%E5%AE%B6%E8%87%AA%E4%B8%BB%E5%88%9B%E6%96%B0%E4%BA%A7%E5%93%81%E8%AE%A4%E5%AE%9A%E7%AE%A1%E7%90%86%E5%8A%9E%E6%B3%95%EF%BC%88%E8%AF%95%E8%A1%8C%EF%BC%89%E3%80%8B%E7%9A%84%E9%80%9A%E7%9F%A5.pdf
MOST. (2000, November 23). <i>Guide for cognizance of independent intellectual property in the high-tech industry</i> . Retrieved from http://www.docin.com/p-85079977.html#documentinfo
MOST. (2000, November 23). <i>Guide on the accreditation of the indigenous intellectual property rights in the high-tech industry</i> . Retrieved from http://www.docin.com/p-85079977.html#documentinfo
MOST. (2007, February 26). <i>Measures on the interpretation of national independent innovation products</i> . Retrieved from http://www.most.gov.cn/ztlz/cxqygzhy/cxqyhydt/200702/t20070226_41506.htm
MOST. (2010, April 9). <i>April 2010 draft notice on indigenous innovation product accreditation</i> . Retrieved from http://www.most.gov.cn/tztg/201004/t20100409_76710.htm
National Bureau of Statistics of China. (2009). <i>2009 China statistical yearbook</i> . Retrieved from http://www.stats.gov.cn/tjsj/ndsj/2009/indexeh.htm
National Intellectual-Property Strategy [NIPSO]. (2012, April 12). <i>2012 major tasks on implementation of Fujian’s IP strategy</i> . Retrieved from http://www.nipso.cn/oneas.asp?id=13601
National Intellectual-Property Strategy [NIPSO]. (2012, April 12). <i>2012 major tasks on implementation of Gansu’s IP strategy</i> . Retrieved from http://www.nipso.cn/oneas.asp?id=13587
National Intellectual-Property Strategy [NIPSO]. (2012, April 12). <i>2012 major tasks on implementation of Guangdong’s IP strategy</i> . Retrieved from http://www.nipso.cn/oneas.asp?id=13595
National Intellectual-Property Strategy [NIPSO]. (2012, May 4). <i>2012 major tasks on implementation of Beijing’s IP strategy</i> . Retrieved from http://www.nipso.cn/oneas.asp?id=14242
National Intellectual-Property Strategy. (2012, April 12). <i>2012 major tasks on implementation of Hebei’s IP strategy</i> . Retrieved from http://www.nipso.cn/oneas.asp?id=13609
National Intellectual-Property Strategy. (2012, April 12). <i>2012 major tasks on implementation of Henan’s IP strategy</i> . Retrieved from http://www.nipso.cn/oneas.asp?id=13599
National Intellectual-Property Strategy. (2012, April 12). <i>2012 major tasks on implementation of Hubei’s IP strategy</i> . Retrieved from http://www.nipso.cn/oneas.asp?id=13598
National Intellectual-Property Strategy. (2012, April 12). <i>2012 major tasks on implementation of Hunan’s IP strategy</i> . Retrieved from http://www.nipso.cn/oneas.asp?id=13596
National Intellectual-Property Strategy. (2012, April 12). <i>2012 major tasks on implementation of Liaoning’s IP strategy</i> . Retrieved from http://www.nipso.cn/oneas.asp?id=13606
National Intellectual-Property Strategy. (2012, April 12). <i>2012 major tasks on implementation of Ningxia Huizu autonomous region’s IP strategy</i> . Retrieved from http://www.nipso.cn/oneas.asp?id=13585
National Intellectual-Property Strategy. (2012, April 12). <i>2012 major tasks on implementation of Qinghai’s IP strategy</i> . Retrieved from http://www.nipso.cn/oneas.asp?id=13586
National Intellectual-Property Strategy. (2012, April 12). <i>2012 major tasks on implementation of Shandong’s IP strategy</i> . Retrieved from http://www.nipso.cn/oneas.asp?id=13600
National Intellectual-Property Strategy. (2012, April 12). <i>2012 major tasks on implementation of Xinjiang Uygur autonomous region’s IP strategy</i> . Retrieved from http://www.nipso.cn/oneas.asp?id=13584

National Intellectual-Property Strategy. (2012, June 4). <i>2012 major tasks on implementation of Heilongjiang's IP strategy</i> . Retrieved from http://www.nipso.cn/one news.asp?id=14235
National Intellectual-Property Strategy. (2012, June 4). <i>2012 major tasks on implementation of Inner Mongolia autonomous region's IP strategy</i> . Retrieved from http://www.nipso.cn/one news.asp?id=14238
National Intellectual-Property Strategy. (2012, June 4). <i>2012 major tasks on implementation of Jiangsu's IP strategy</i> . Retrieved from http://www.nipso.cn/one news.asp?id=14233
National Intellectual-Property Strategy. (2012, June 4). <i>2012 major tasks on implementation of Jilin's IP strategy</i> . Retrieved from http://www.nipso.cn/one news.asp?id=14236
National Intellectual-Property Strategy. (2012, June 4). <i>2012 major tasks on implementation of Shanghai's IP strategy</i> . Retrieved from http://www.nipso.cn/one news.asp?id=14234
National Intellectual-Property Strategy. (2012, June 4). <i>2012 major tasks on implementation of Shanxi's IP strategy</i> . Retrieved from http://www.nipso.cn/one news.asp?id=14239
National Intellectual-Property Strategy. (2012, June 4). <i>2012 major tasks on implementation of Tianjin's IP strategy</i> . Retrieved from http://www.nipso.cn/one news.asp?id=14241
National Torch Program. (2010, December 8). <i>Notice regarding lists of companies recognised as key high-and-new technology enterprises (HNTEs)</i> . Retrieved from http://www.innocom.gov.cn/web/static/articles/catalog_2/2010-12-09/article_282041042cb0ab79012ccaa9706c000f/282041042cb0ab79012ccaa9706c000f.html
NDRC and MOFCOM. (2011, December 24). <i>Foreign investment industrial guidance catalogue (2011 revision)</i> . Retrieved from http://www.ndrc.gov.cn/zcfb/zcfbl/2011ling/W020111229379511927834.pdf
Ningxia Huizu Autonomous Region People's Government. (2007, September 27). <i>Notice on launching intellectual property strategy compendium of Ningxia Huizu autonomous region</i> . Retrieved from http://govinfo.nlc.gov.cn/nxfz/zfgb/201120/201111/t20111124_1144182.html?classid=423
People's Government of Hunan Province. (2012, February 29). <i>Hunan's outline on constructing an innovative province</i> . Retrieved from http://www.hunan.gov.cn/zwgk/hndt/zwdt/201203/t20120308_457488.htm
Qingdao Science and Technology Bureau. (2008, August 1). <i>Qingdao city indigenous innovation product accreditation management rules (provisional)</i> . Retrieved from http://china.trade2cn.com/news/NX70ltD355S0sv0-1.html
Qinghai Province People's Government. (2008, November 19). <i>Notice of advices on implementation of national intellectual property strategy compendium</i> . Retrieved from http://www.qhys.gov.cn/html/42/21102.html
Qinghai Province Department of Science and Technology. (2010, May 27). <i>Qinghai province indigenous innovation product accreditation management rules</i> . Retrieved from http://www.qhppc.com/html/zhengcefagui/20100527/409.html
Shaanxi Intellectual Property Office. (2011, May 20). <i>Shaanxi's 12th Five Year Plan on intellectual property (patent) development</i> . Retrieved from http://www.snipo.gov.cn/ReadNews.asp?NewsID=11091&BigClassName=%D6%AA%CA%B6%B2%FA%C8%A8%B9%A4%D7%F7%A1%B0%CA%AE%B6%FE%CE%E5%A1%B1%B9%E6%BB%AE&SmallClassName=%B9%A4%D7%F7%B6%AF%CC%AC
Shaanxi Province People's Government. (2008, November 14). <i>Notice on launching Shaanxi intellectual property strategy compendium (2008-2020) and Shaanxi intellectual property strategy implementation plan (2008-2010)</i> . Retrieved from http://www.shaanxi.gov.cn/0/103/6295.htm
Shandong Intellectual Property Office. (2011, July 15). <i>Shandong's 12th Five Year Plan on patent development</i> . Retrieved from http://www.sipo.gov.cn/dfzz/shandong/zcfg/sjwj/201107/t20110715_611387.htm
Shanghai Intellectual Property Administration on State Intellectual Property Office of P.R.C. (2011,

November 19). <i>Shanghai's 12th Five Year Plan on intellectual property development</i> . Retrieved from http://www.sipa.gov.cn/gb/zscq/node2/node23/userobject1ai9309.html
Shanghai Intellectual Property Bureau. (2011, April 8). <i>Launch drafting Shanghai intellectual property strategy compendium (2011-2020)</i> . Retrieved from http://www.sipo.gov.cn/dttx/gn/2011/201104/t20110408_595729.html
Shanghai Intellectual Property Rights Bureau. (2005, May 23). <i>Implementing measures for the administration of Shanghai's exhibition industry</i> . Retrieved from http://www.shanghai.gov.cn/shanghai/node2314/node3124/node3164/node3172/userobject6ai1415.html
Shanxi Intellectual Property Office. (2011, December 26). <i>A general notice by Shanxi Intellectual Property Office: Shanxi's 12th Five Year Plan on Intellectual Property (patent) development</i> . Retrieved from http://218.26.227.183:8000/zscqj/sjdt/1451.htm
Sichuan Province Department of Science and Technology, Sichuan Province Development and Reform Commission, Sichuan Province Economy Commission, & Sichuan Province Department of Finance. (2009). <i>Sichuan province's indigenous innovation product accreditation implementing management rules (provisional)</i> . http://jscx.scst.gov.cn/NewsContent.aspx?current=%E6%94%BF%E7%AD%96%E6%96%87%E4%BB%B6&NewsID=240
Sichuan Intellectual Property Office. (2012, February 5). <i>Major tasks regarding Sichuan's patent development for 2012</i> . Retrieved from http://www.sc.gov.cn/zt_scht/2012zscq/2012zscq/201202/t20120206_1170227.shtml
Sichuan Intellectual Property Office. (2012, February 6). <i>Notice on launching 2012 implementation plan of Sichuan intellectual property strategy</i> . Retrieved from http://www.sc.gov.cn/zt_scht/2012zscq/2012zscq/201202/t20120206_1170226.shtml
SIPO. (2008, March 19). <i>Instructions on patent fee payment</i> . Retrieved from http://www.sipo.gov.cn/zlsqzn/sqq/zlfy/200804/t20080422_390241.html
SIPO. (2010, January 21). <i>Patent examination guidelines</i> . Retrieved from http://www.sipo.gov.cn/zlsqzn/sczn2010.pdf
SIPO. (2010, November 11). <i>National patent development strategy (2011-2020)</i> . Retrieved from http://www.sipo.gov.cn/ztl/ndcs/zgzl/5thpatentweek/pw005strategy/201111/t20111101_627123.html
SIPO. (2011). <i>Comments on measures for compulsory licensing</i> . Retrieved from http://www.sipo.gov.cn/tz/gz/201110/P020111012508894173220.doc
SIPO. (2012, April 10). <i>Promotion plan for the implementation of the national intellectual property strategy in 2012</i> . Retrieved from http://www.sipo.gov.cn/twzb/2012zscqjlsstjh/bjzl/201204/t20120410_667306.html
SIPO. (2012, June 19). <i>Administrative measures on the priority examination of invention patent applications</i> . Retrieved from http://www.sipo.gov.cn/zwgs/ling/201206/t20120621_712805.html
SIPO. (2012, March 15). <i>Notice on patent compulsory licensing</i> . Retrieved from http://www.sipo.gov.cn/zwgs/ling/201203/t20120319_654876.html
<i>Standardisation administration of the People's Republic of China's 2009 regulations on administration of formulating and revising national standards involving patents</i>
Standing Committee of the National People's Congress. (2007, August 30). <i>Anti-monopoly law</i> . Retrieved from http://www.lawinfochina.com/display.aspx?lib=law&id=6351
Standing Committee of the National People's Congress. (2008, December 27). <i>Patent law (2008)</i> . Retrieved from http://www.lawinfochina.com/display.aspx?lib=law&id=7289
State Council Information Office of the People's Republic of China [SCIO]. (2011, March 17). <i>The 12th Five-Year Plan for national economic and social development of the People's Republic of China</i> . Retrieved from http://www.scio.gov.cn/zxbd/gdxw/201103/t876235.htm
State Council. (2006, February 9). <i>Guidelines on the national medium- and long-term program for</i>

<i>science and technology development (2006-2020)</i> . Retrieved from http://www.gov.cn/jrzg/2006-02/09/content_183787.htm
State Council. (2007, December 29). <i>Law on scientific and technological progress</i> . Retrieved from http://www.gov.cn/flfg/2007-12/29/content_847331.htm
State Council. (2008, June 5). <i>Outline of the national intellectual property strategy</i> . Retrieved from http://www.gov.cn/gongbao/content/2008/content_1018942.htm
State Council. (2010, January 9). <i>Detailed rules for the implementation of the rules for implementation of the patent law</i> . Retrieved from http://www.sipo.gov.cn/zcfg/flfg/zl/fljxzfg/201001/t20100122_488461.html
State Council. (2010, January). <i>Implementing rules of the patent law</i> . Retrieved from http://www.ccpit-patent.com.cn/references/Implementing_Regulations_Patent_Law_China.htm
State Council. (2011, April 28). <i>Notice of the General Office of the State Council on advancing several opinions of ten departments including SIPO on strengthening the work of IPR in strategic emerging industries [SC Notice on IPR in strategic emerging industries]</i> . Retrieved from http://www.gov.cn/zwgk/2012-05/02/content_2127881.htm
State Council. (2011, December 10). <i>Regulations on technology import and export administration [TIER]</i> . Retrieved from http://www.china.com.cn/chinese/PI-c/87904.htm
State Intellectual Office of P.R.C. [SIPO]. (2012, February 23). <i>Plan put forward on the implementation of 2012 Heilongjiang's IP strategy</i> . Retrieved from http://www.sipo.gov.cn/twzb/2012hljzscq/2012hljzscqbjzl/201202/t20120223_646396.html
State Intellectual Property Office of P.R.C. (2011, May 26). <i>Key points on the implementation of Shandong intellectual property strategy</i> . Retrieved from http://www.sipo.gov.cn/dtxx/zlgzdt/2011/201105/t20110526_605561.html
State Intellectual Property Office of P.R.C. (2012, June 4). <i>Key points on the implementation of Inner Mongolia autonomous region 2012 intellectual property strategy</i> . Retrieved from http://www.nipso.cn/oneas.asp?id=14238
State Intellectual Property Office of P.R.C. (2012, March 28). <i>2012 Major tasks regarding Anhui's patent development for 2012</i> . Retrieved from http://www.sipo.gov.cn/dtxx/gn/2012/201203/t20120327_659916.html
Supreme People's Court. (2009, December 21). <i>SPC's judicial interpretation on some issues concerning the application of laws to the trial of patent infringement disputes</i> . Retrieved from http://www.court.gov.cn/qwfb/sfjs/201001/t20100129_759.htm
Supreme People's Court. (2011, December 16). <i>December 16th 2011 SPC opinion- Opinions of the Supreme People's Court on giving full play to the functional role of intellectual property trials in advancing the great development and prosperity of socialist culture and promoting independent and coordinated economic development [Fa Fa, 2011, No. 18]</i> . Retrieved from Westlaw China. Web site: http://www.westlawchina.com/index_en.html
Third Meeting of 8th National People's Congress Standing Committee, Zhuxi Ling (1993) No.10, <i>Unfair competition law of P.R China</i> . Retrieved from http://www.saic.gov.cn/fldyfbzdzj/zcfg/fv/200909/t20090928_71369.html
Tianjin Intellectual Property Office. (2011, December 23). <i>Notice on launching Tianjin's 12th Five Year Plan on patent</i> . Retrieved from http://zc.k8008.com/html/tianjin/shizhichanju/2011/1223/131829.html
Tianjin Intellectual Property Office. (2011, December 23). <i>Tianjin's 12th Five Year Plan on intellectual property development</i> . Retrieved from http://www.sipo.gov.cn/dfzz/tianjin/tzgg/201112/P020111222635593820156.pdf
Tianjin People's Government. (2010, March 15). <i>Notice on launching intellectual property strategy compendium of Tianjin</i> . Retrieved from http://www.tj.gov.cn/zwgk/wjgz/szfwj/201003/t20100324_115195.htm

Tibet Autonomous Region People's Government. (2012, May 25). <i>Science and technology development plan of Tibet autonomous region 12th Five Year Plan--Further enacting intellectual property strategy (2012) No.53</i> . Retrieved from http://www.tibetsti.gov.cn/Item.aspx?id=2562
World Trade Organization. [WTO]. (1994, TRIPS). <i>Trade related aspects of intellectual property rights (TRIPS) Agreement</i>
WTO [1994] <i>Subsidies and countervailing measures (SCM) agreement</i>
WTO [2001, Nov.] <i>Protocol on the accession of the People's Republic of China</i>
WTO [2001, Oct.] <i>Report on the working party on the accession of China</i>
Xinjiang Uygur Autonomous Region. (2011, August 7). <i>The implementation plan on intellectual property strategy compendium of Xinjiang Uygur autonomous region (2011-2015)</i> . Retrieved from http://www.xinjiang.gov.cn/xxgk/gwgb/zfwj/2011/81616.htm
Yunnan Intellectual Property Office. (2012, February 15). <i>Report of summary for 2011 IP work and major tasks for 2012 IP work by Yunnan intellectual property office</i> . Retrieved from http://www.ynipo.gov.cn/newsview.aspx?id=3075
Yunnan Province People's Government. (2009, August 7). <i>Notice of Advices on implementation of national intellectual property strategy compendium by Yunnan Province people's government (2008) No.18</i> . Retrieved from http://www.sipo.gov.cn/dfzz/yunnan/zcfg/zc/200908/t20090807_471689.htm
Zhejiang Province People's Government. (2009, December 22). <i>Notice of advices on implementation of national intellectual property strategy compendium by Zhejiang Province People's Government (2009) No.189</i> . Retrieved from http://www.zjpat.gov.cn/details.aspx?newsId=c644de29-7495-4cda-b341-2bc9b51beeb6
Zhejiang Provincial Department of Technology. (2012, February 1). <i>Zhejiang's 12th Five Year Plan on patent development</i> . Retrieved from http://www.zjkjt.gov.cn/news/node01/detail0101/2012/0101_28641.htm

Table 14: Comparison chart: Citations for major recent provincial/municipal IP plans and strategies reviewed

Province/Municipality	12 th Five Year IP Plan/equivalent plan** (citation) Time period: 2011-2015	IP Strategy/equivalent strategy** (citation)
Anhui	<i>Anhui's 12th Five Year Plan on Intellectual Property (Patent) Development</i> issued on November 17 th 2011 by the Anhui Intellectual Property Office Link: http://www.ahipo.gov.cn/dt2111111175.asp?DocID=2111116610	No multi-year plan, <i>Major Tasks Regarding Anhui's Patent Development for 2012</i> issued on March 28 th 2012 Link: http://www.sipo.gov.cn/dtxx/gn/2012/201203/t20120327_659916.html
Beijing	<i>Notice on Launching Beijing's 12th Five Year Plan on Intellectual Property (Patent) Development</i> issued on August 24 th 2011 by Beijing Intellectual Property Bureau and Beijing Development and Reform Commission	<i>Advice on Implementation of the Beijing Intellectual Property Strategy Compendium by the Beijing People's Government</i> issued on May 6 th 2009 by the Beijing People's Government

	<p>Link: http://www.bjipo.gov.cn/zcfg/zlgh/201202/t20120207_25714.html.</p>	<p>Link: http://www.gov.cn/gzdt/2009-05/06/content_1305629.htm</p> <p><i>**2012 Major Tasks on Implementation of Beijing's IP Strategy</i> issued on May 4th 2012 under the National Intellectual Property Strategy</p> <p>Link: http://www.nipso.cn/onevs.asp?id=14242</p>
Chongqing	<p><i>Chongqing's 12th Five Year Plan on Intellectual Property (Patent) Development</i> issued on October 27th 2011 by the general office of Chongqing Municipal People's Government</p> <p>Link: http://www.cqipo.gov.cn/templet/default/ShowArticle.jsp?id=5421</p>	None
Fujian	None	<p><i>Advice on Implementation of the National Intellectual Property Strategy Compendium by the Fujian Province People's Government</i> issued on January 30th 2010 by the Fujian Province People's Government</p> <p>Link: http://baike.baidu.com/view/3357924.htm</p> <p><i>**2012 Major Tasks on Implementation of Fujian's IP Strategy</i> issued on April 12th 2012 under the National Intellectual Property Strategy</p> <p>Link: http://www.nipso.cn/onevs.asp?id=13601</p>
Gansu	<p><i>Gansu's 12th Five Year Plan on Intellectual Property (Patent) Development</i> issued on March 22nd 2011 by the Gansu Intellectual Property Office</p> <p>Link: http://www.gsipo.gov.cn/zcfg/detail.php?n_no=38287&dir=/%D5%FE%B2%DF%B7%A8%B9%E6/%C6%E4%CB%FB</p>	<p><i>Notice on Launching Gansu Intellectual Property Strategy Compendium by the Gansu Province People's Government (2010) No.49</i> issued on June 18th 2010 by the Gansu Province People's Government</p> <p>Link: http://www.gsipo.gov.cn/zscqzl/detail.php?n_no=36798</p> <p><i>**2012 Major Tasks on Implementation of Gansu's IP Strategy</i> issued on April 12th 2012 under the National Intellectual Property Strategy</p>

		<p>Link: http://www.nipso.cn/onevs.asp?id=13587</p>
Guangdong	<p><i>Guangdong's 12th Five Year Plan on Intellectual Property (Patent) Development</i> issued on August 10th 2011 by the General Office of Guangdong Province's People's Government</p> <p>Link: http://zwgk.gd.gov.cn/006939748/201108/t20110823_269558.html</p>	<p><i>Intellectual Property strategy compendium of Guangdong Province (2007-2020)</i> issued on March 27th 2012 by the Guangdong Intellectual Property Office</p> <p>Link: http://www.sipo.gov.cn/twzb/gdyjkbys/bjzl/201203/t20120327_659900.html</p> <p><i>**2012 Major Tasks on Implementation of Guangdong's IP Strategy</i> issued on April 12th 2012 under the National Intellectual-Property Strategy</p> <p>Link: http://www.nipso.cn/onevs.asp?id=13595</p>
Guangxi	<p><i>Guangxi Autonomous Region's 12th Five Year Plan on Science and technology Development</i> issued on August 8th 2011 by the Development and Reform Commission of Guangxi Autonomous region and the Science and Technology Office of the Guangxi Autonomous Region</p> <p>Link: http://gov.gxsti.net/zwgk/zxtz/613832.shtml</p>	<p><i>Notice on Advice for Launching the Guangxi Autonomous Region Intellectual Property Strategy Compendium by the Guangxi Autonomous Region People's Government (2009) No.109</i> issued on December 23th 2009 by the Guangxi Autonomous Region's People's Government</p> <p>Link: http://www.gxipo.net/zcfg/zl/554850.shtml</p>
Guizhou	<p><i>Guizhou's 12th Five Year Plan on Intellectual Property (Patent) Development</i> issued on October 13th 2011 by the Guizhou Intellectual Property Office</p> <p>Link: http://www.chinagzpp.cn/Article/ShowArticle.asp?ArticleID=1110</p>	<p><i>Intellectual Property Strategy Compendium of Guizhou Province (2006-2015)</i> issued on February 14th 2009 by the Guizhou Intellectual Property Office</p> <p>Link: http://www.jsip.gov.cn/news/ztbd/ztbdcs/ztbdpd9/200902/20090214_51568.html</p>
Hainan	<p><i>Hainan's 12th Five Year Plan on Patent Development</i> issued on December 27th 2011 by the Hainan Intellectual Property Office</p> <p>Link http://www.hipo.gov.cn/list.asp?id=3165</p>	<p><i>Intellectual Property Strategy Compendium of Hainan Province</i> issued on July 6th 2010 by the Hainan Intellectual Property Office</p> <p>Link: http://www.hipo.gov.cn/list.asp?id=2883</p>
Hebei	<i>Hebei's 12th Five Year Plan on</i>	<i>Advice on Implementation of the National</i>

	<p><i>Patent Development</i> issued on June 10th 2011 by the Hebei Intellectual Property Office</p> <p>Link: http://218.12.44.17/content.jsp?code=40170382-3/2011-00104&name</p>	<p><i>Intellectual Property Strategy Compendium by the Hebei Province People's Government</i> issued on June 22th 2009 by the Hebei Province People's Government</p> <p>Link: http://2010.hebstd.gov.cn/?thread-64-1.html</p> <p>**2012 Major Tasks on Implementation of Hebei's IP Strategy issued on April 12th 2012 under the National Intellectual Property Strategy</p> <p>Link: http://www.nipso.cn/oneews.asp?id=13609</p>
Heilongjiang	None	<p><i>Notice on Launching the Heilongjiang Intellectual Property Strategy Compendium by Heilongjiang Province People's Government (2011-2020)</i> issued on May 22nd 2011 by the Heilongjiang Province People's Government</p> <p>Link: http://baike.baidu.com/view/7153606.htm</p> <p>**Plan to Put Forward Implementation of Heilongjiang's 2012 IP Strategy issued on February 23rd 2012</p> <p>Link: http://www.sipo.gov.cn/twzb/2012hljzscq/2012hljzscqbjzl/201202/t20120223_646396.html</p> <p>**2012 Major Tasks on Implementation of Heilongjiang's IP Strategy issued on June 4th 2012 under the National Intellectual Property Strategy</p> <p>Link: http://www.nipso.cn/oneews.asp?id=14235</p>
Henan	<p><i>Henan's 12th Five Year Plan on intellectual Property Development</i> issued on December 20th 2010 by the Henan Intellectual Property Office</p>	<p><i>Intellectual Property Strategy Compendium of Henan Province (2008) No.59</i> issued on November 23rd 2008 by the Henan Intellectual Property Office</p> <p>Link:</p>

	<p>Link: http://hnszscqzlw.cn/ArticleShow.asp?id=89</p>	<p>http://www.hnpatent.gov.cn/patentwebsite/show.do?method=show&id=3577</p> <p><i>**2012 Major Tasks on Implementation of Henan's IP Strategy</i> issued on April 12th 2012 under the National Intellectual Property Strategy</p> <p>Link: http://www.nipso.cn/onevs.asp?id=13599</p>
Hubei	<p><i>Hubei's 12th Five Year Plan on Intellectual Property (Patent) Development</i> issued on July 29th 2011 by the Hubei Intellectual Property Bureau</p> <p>Link: http://www.hbipo.gov.cn/upfile/20100729011527652.doc</p>	<p><i>Intellectual Property Strategy Compendium of Hubei Province</i> by Hubei Province People's Government issued on August 11th 2010 by the Hubei Province People's Government</p> <p>Link: http://www.xinhuanet.com/chinanews/2010-08/25/content_20711850.htm http://www.hbipo.gov.cn/upfile/20110307162744906.doc</p> <p><i>**2012 Major Tasks on Implementation of Hubei's IP Strategy</i> issued on April 12th 2012 under the National Intellectual Property Strategy</p> <p>Link: http://www.nipso.cn/onevs.asp?id=13598</p>
Hunan	<p><i>Hunan's 12th Five Year Plan on Patent Development</i> issued on May 7th 2012 by the Hunan Intellectual Property Office and Development and Reform Commission of Hunan Province</p> <p>Link: http://www.sipo.gov.cn/dtxx/zlgzdt/2012/201205/t20120507_687187.html</p>	<p><i>Intellectual Property Strategy Compendium of Hunan Province</i> by the Hunan Province People's Government issued on March 27th 2010 by the Hunan Province People's Government</p> <p>Link: http://news.163.com/09/0327/11/55DK0BOK000120GU.html</p> <p><i>**2012 Major Tasks on Implementation of Hunan's IP Strategy</i> issued on April 12th 2012 under the National Intellectual Property Strategy.</p> <p>Link: http://www.nipso.cn/onevs.asp?id=13596</p>
Inner Mongolia	None	<p><i>Key points in the Implementation of the Inner Mongolia Autonomous Region 2012 Intellectual Property Strategy</i> issued on June 4th 2012</p>

		<p>Link: http://www.nipso.cn/one news.asp?id=14238</p> <p><i>**2012 Major Tasks on Implementation of Inner Mongolia Autonomous Region's IP Strategy</i> issued on June 4th 2012 under the National Intellectual Property Strategy</p> <p>Link: http://www.nipso.cn/one news.asp?id=14238</p>
Jiangsu	<p><i>Jiangsu's 12th Five Year Plan on Patent Development</i> issued on November 2nd 2011 by the Intellectual Property Office of Jiangsu Province</p> <p>Link: http://www.jsip.gov.cn/laws/bmgf xwj/201112/20111216_70465.html</p>	<p><i>Notice on Launching the Intellectual Property Strategy Compendium of Jiangsu Province by Jiangsu Province People's Government</i> issued on January 5th 2009 by the Jiangsu Province People's Government</p> <p>Link: http://www.jsip.gov.cn/news/ywdtnews/200901/20090112_50874.html</p> <p><i>**2012 Major Tasks on Implementation of Jiangsu's IP Strategy</i> issued on June 4th 2012 under the National Intellectual Property Strategy.</p> <p>Link: http://www.nipso.cn/one news.asp?id=14233</p>
Jiangxi	None	<p>Call for comments on the Jiangxi Province Intellectual Property Strategy Compendium by the Intellectual Property Office of Jiangxi Province on April 6th 2011</p> <p>Link: http://zl.ncinfo.gov.cn/readnews.asp?id=2292</p>
Jilin	None	<p><i>**2012 Major Tasks on Implementation of Jilin's IP Strategy</i> issued on June 4th 2012 under the National Intellectual Property Strategy.</p> <p>Link: http://www.nipso.cn/one news.asp?id=14236</p>
Liaoning	<p><i>Liaoning's 12th Five Year Plan on Patent Development</i> issued on November 15th 2011 by the Intellectual Property Office of Liaoning</p> <p>Link: http://www.lnipo.gov.cn/zscqjweb</p>	<p><i>Intellectual Property Strategy Compendium of Liaoning Province by the Liaoning Province People's Government</i> issued on June 8th 2011 by the Intellectual Property Office of Liaoning</p> <p>Link: http://www.lnipo.gov.cn/zscqjweb/zsweb/in</p>

	/zswweb/informationShow.jsp?sectorId=yewgh&infold=bb45458632fb1d2c0133a58bdb5901b8	formationShow.jsp?sectorId=zscqzlgly&infold=bb4545863068d15001306d2df5070046 <i>**2012 Major Tasks on Implementation of Liaoning's IP Strategy</i> issued on April 12 th 2012 under the National Intellectual Property Strategy Link: http://www.nipso.cn/oneNews.asp?id=13606
Ningxia	None	<i>Notice on Launching the Intellectual Property Strategy Compendium of Ningxia Huizu Autonomous Region by Ningxia Huizu Autonomous Region People's Government</i> issued on September 27 th 2011 by the Ningxia Huizu Autonomous Region People's Government Link: http://govinfo.nlc.gov.cn/nxfz/zfgb/201120/201111/t20111124_1144182.html?classid=423 <i>**2012 Major Tasks on Implementation of Ningxia Huizu Autonomous Region's IP Strategy</i> issued on April 12 th 2012 under the National Intellectual Property Strategy Link: http://www.nipso.cn/oneNews.asp?id=13585
Qinghai	None	<i>Notice of Advice on Implementation of the National Intellectual Property Strategy Compendium by the Qinghai Province People's Government</i> issued on November 19 th 2008 by the Qinghai Province People's Government Link: http://www.qhys.gov.cn/html/42/21102.html <i>**2012 Major Tasks on Implementation of Qinghai's IP Strategy</i> issued on April 12 th 2012 under the National Intellectual-Property Strategy Link: http://www.nipso.cn/oneNews.asp?id=13586
Shaanxi	<i>Shaanxi's 12th Five Year Plan on Intellectual Property (Patent) Development</i> issued on May 20 th	<i>Notice on Launching the Shaanxi Intellectual Property Strategy Compendium (2008-2020) and Shaanxi Intellectual Property Strategy</i>

	<p>2011 by the Shaanxi Intellectual Property Office</p> <p>Link: http://www.snipo.gov.cn/ReadNews.asp?NewsID=11091&BigClassName=%D6%AA%CA%B6%B2%FA%C8%A8%B9%A4%D7%F7%A1%B0%CA%AE%B6%FE%CE%E5%A1%B1%B9%E6%BB%AE&SmallClassName=%B9%A4%D7%F7%B6%AF%CC%AC</p>	<p><i>Implementation Plan (2008-2010) by the Shaanxi Province People's Government</i> issued on November 14th 2008 by the Shaanxi Province People's Government</p> <p>Link: http://www.shaanxi.gov.cn/0/103/6295.htm</p>
Shandong	<p><i>Shandong's 12th Five Year Plan on Patent Development</i> issued on July 15th 2011 by the Shandong Intellectual Property Office</p> <p>Link: http://www.sipo.gov.cn/dfzz/shandong/zcfg/sjwj/201107/t20110715_611387.htm</p>	<p><i>Key points on the Implementation of the Shandong Intellectual Property Strategy</i> issued on May 26th 2011</p> <p>Link: http://www.sipo.gov.cn/dtxx/zlgzdt/2011/201105/20110526_605561.html</p> <p><i>**2012 Major Tasks on Implementation of Shandong's IP Strategy</i> issued on April 12th 2012 under the National Intellectual Property Strategy</p> <p>Link: http://www.nipso.cn/onews.asp?id=13600</p>
Shanghai	<p><i>Shanghai's 12th Five Year Plan on Intellectual Property Development</i> issued on November 19th 2011 by the Shanghai Intellectual Property Administration (officially published on Shanghai Intellectual Property Administration's website on April 16th 2012)</p> <p>Link: http://www.sipa.gov.cn/gb/zscq/node2/node23/userobject1ai9309.html</p> <p>Link http://www.sipo.gov.cn/dtxx/gn/2011/201111/t20111109_629911.html</p>	<p><i>Notice on Drafting the Shanghai Intellectual Property Strategy Compendium (2011-2020)</i> issued on April 8th 2011 by Shanghai Intellectual Property Administration</p> <p>Link: http://www.sipo.gov.cn/dtxx/gn/2011/201104/t20110408_595729.html</p> <p><i>**2012 Major Tasks on Implementation of Shanghai's IP Strategy</i> issued on June 4th 2012 under the National Intellectual Property Strategy</p> <p>Link: http://www.nipso.cn/onews.asp?id=14234</p>
Shanxi	<p><i>**A general notice by Shanxi Intellectual Property Office: Shanxi's 12th Five Year Plan on Intellectual Property (Patent) Development</i> issued on December 26th 2011 by the Shanxi Intellectual</p>	<p><i>Notice on Drafting the Shanxi Intellectual Property strategy Compendium</i> issued on August 13th 2009 by the Department of Science and Technology in Shanxi</p> <p>Link:</p>

	<p>Property Office</p> <p>Link: http://218.26.227.183:8000/zscqj/sjdt/1451.htm</p>	<p>http://www.shanxigov.cn/n16/n1611/n3539/n7299/n20244/8365727.html</p> <p><i>**2012 Major Tasks on Implementation of Shanxi's IP Strategy</i> issued on June 4th 2012 under the National Intellectual Property Strategy</p> <p>Link: http://www.nipso.cn/onevs.asp?id=14239</p>
Sichuan	None	<p><i>Notice on Launching the 2012 Implementation Plan of Sichuan Intellectual Property Strategy by the Sichuan Province People's Government (2012) No.14</i> issued on February 6th 2012 by Sichuan Intellectual Property Office</p> <p>Link: http://www.sc.gov.cn/zt_sczt/2012zscq/2012zscq/201202/t20120206_1170226.shtml</p> <p><i>**Major Tasks Regarding Sichuan's Patent Development for 2012</i> issued on February 5th 2012 by the Sichuan Intellectual Property Office</p> <p>Link: http://www.sc.gov.cn/zt_sczt/2012zscq/2012zscq/201202/t20120206_1170227.shtml</p>
Tianjin	<p><i>Tianjin's 12th Five Year Plan on Intellectual Property Development</i> issued on December 23rd 2011 by the Tianjin Intellectual Property Office</p> <p>Link: http://www.sipo.gov.cn/dfzz/tianjin/tzgg/201112/P020111222635593820156.pdf</p> <p><i>Notice on Launching Tianjin's 12th Five Year Plan on Patents</i> issued on December 23rd 2011 by the Tianjin Intellectual Property Office</p> <p>Link: http://zc.k8008.com/html/tianjin/s hizhichanju/2011/1223/131829.html</p>	<p><i>Notice on Launching the Intellectual Property Strategy Compendium of Tianjin</i> issued on March 15th 2010 by the Tianjin People's Government</p> <p>Link: http://www.tj.gov.cn/zwgk/wjgz/szfwj/201003/t20100324_115195.htm</p> <p><i>**2012 Major Tasks on Implementation of Tianjin's IP Strategy</i> issued on June 4th 2012 under the National Intellectual Property Strategy</p> <p>Link: http://www.nipso.cn/onevs.asp?id=14241</p>
Tibet	None	<p><i>Science and Technology Development Plan of the Tibet Autonomous Region 12th Five Year</i></p>

		<p><i>Plan for Further Enacting the Intellectual Property Strategy (2012) No.53</i> issued on May 25th 2012 by the Tibet Autonomous Region People's Government</p> <p>Link: http://www.tibetsti.gov.cn/Item.aspx?id=2562</p> <p><i>Great Progress Made Towards Protecting Intellectual Property Rights in the Xizang Autonomous Region</i> issued on May 29th 2011</p> <p>Link: http://www.sipo.gov.cn/mtjj/2011/201105/t20110526_605517.html</p>
Xinjiang	None	<p><i>Notice on Launching the Intellectual Property Strategy Compendium of the Xinjiang Uygur Autonomous Region</i> issued on April 19th 2010 by the government of Xinjiang Uygur Autonomous Region</p> <p>Link: http://www.akss.gov.cn/childsite/kjj/index.php?option=com_content&view=article&id=360:2010-05-10-09-03-45&catid=46:2009-04-21-01-31-28&Itemid=77</p> <p><i>The Implementation Plan on the Intellectual Property Strategy Compendium of the Xinjiang Uygur Autonomous Region (2011-2015)</i> issued on August 7th 2011 by the Xinjiang Uygur Autonomous Region</p> <p>Link: http://www.xinjiang.gov.cn/xxgk/gwgb/zfwj/2011/81616.htm</p> <p><i>**2012 Major Tasks on Implementation of the Xinjiang Uygur Autonomous Region's IP Strategy</i> issued on April 12th 2012 under the National Intellectual Property Strategy</p> <p>Link: http://www.nipso.cn/onevs.asp?id=13584</p>
Yunnan	<i>Yunnan's 12th Five Year Plan on Intellectual Property (Patent) Development</i> issued on March 24 th 2011 by the Intellectual Property Office of Yunnan Province	<p><i>Notice on Advice for Implementation of the National Intellectual Property Strategy Compendium by Yunnan Province People's Government (2008) No.18</i> issued on August 7th 2009 by the Yunnan Province People's Government</p>

	<p>Link: http://www.ynipo.gov.cn/newsview.aspx?id=3074</p>	<p>Link: http://www.sipo.gov.cn/dfzz/yunnan/zcfg/zc/200908/t20090807_471689.htm</p> <p><i>**Summary Report for the 2011 IP Work and Major Tasks for 2012 IP Work by the Yunnan Intellectual Property Office issued on February 15th 2012 by Yunnan Intellectual Property Office</i></p> <p>Link: http://www.ynipo.gov.cn/newsview.aspx?id=3075</p>
Zhejiang	<p><i>Zhejiang's 12th Five Year Plan on Patent Development</i> issued on February 1st 2012 by the Zhejiang Provincial Department of Technology</p> <p>Link: http://www.zjkit.gov.cn/news/nod_e01/detail0101/2012/0101_28641.htm</p>	<p><i>Notice on Advice for Implementation of the National Intellectual Property Strategy Compendium by Zhejiang Province People's Government (2009) No.189</i> issued on December 22th 2009 by the Zhejiang Province People's Government</p> <p>Link: http://www.zjpat.gov.cn/details.aspx?newsId=c644de29-7495-4cda-b341-2bc9b51beeb6</p>

†Note: readily available 2012 patent and IP development plans included in chart to provide an idea of the one year initiatives of provinces/municipalities ostensibly meant as an additional method of implementing the multi-year plans and strategies set out. ** Refers to annual (for one year) implementing measures only.

VII Annexes⁴⁰⁶

Introduction:

I: Explicit mentions of IP and/or patent quality in major recently promulgated Chinese policy documents

Table 15: Example patent quality references in China’s Provincial/Municipal 12th Five Year IP Plans and recent IP Strategies, and equivalent plans and strategies

Province/ Municipality /Autonomous Region	From 12 th Five Year IP Plans and/or equivalent plans**	From IP Strategies and/or other equivalent strategies
Anhui	<p><i>IP Plan issued in 2011</i></p> <p>Section 4, Part3, Article 9: <i>“Increase support for the industrialisation of patented technologies. Strive to establish special funds for patent application and industrialisation, to establish the patent award in Anhui Province, and to improve the province’s patent output quality and level of industrialisation. Set up the patent industrialisation pilot base, and to carry out the patent business-support pilot projects to promote non-service invention and patent ventures for SMEs.”</i></p> <p>Section3, Part3: <i>The “three shift” work-focus of the Anhui Provincial IP strategy: First, shift the work focus from quantity increase to quality improvement; Second, shift the work focus from intellectual property applications for grants to support of the transformation of patents; Third, shift the work focus from the popularity of awareness to the improvement of the intellectual property environment.”</i></p> <p><i>“Basic principles: government guidance, highlighting the main points: incremental stability, improving quality, encouraging innovation, and focusing on conversion and enhanced protection, to create a new environment.”</i></p>	None

⁴⁰⁶ Special thanks to both Ruben Moen, Working Group Assistant at the European Chamber, for his help in compiling some of the statistics in this Annex; and to Linjia Dai, Working Group Assistant at the European Chamber, for her help in double-checking many of the statistics and some translations provided in this Annex and the body of this study.

<p>Beijing</p>	<p><i>IP Plan issued in 2011</i></p> <p>Section 3, Part 4, Article 2: <i>“Centered on hundreds of Zhongguancun pilot businesses; on the basis of industry alliances, guide the establishment of enterprises in the demonstration area and complete the IPR management system to improve the quantity and quality of the intellectual properties in enterprises in the area.</i></p> <p>Section 3, Part 5, Article 1: <i>“...Optimise the incentive policies for intellectual property, explore and take the quantity and quality of intellectual properties as important criteria for ascertaining key laboratory and key research bases and as vital requirements for determining technical or professional titles and respective promotion. Strengthen practical construction bases of examiners, better ensuring the services of examiners and enterprises.”</i></p> <p>Section 3, Part 7, Article 1: <i>“ ... Ensure the funding of patent applications, regulate the patent applications of enterprises, and improve the quality of the patent applications by enterprises...”</i></p>	<p><i>IP Strategy issued in 2009</i></p> <p>Section 3, Part 3, Paragraph 1: <i>“...Optimise incentive policies for intellectual property, explore and take the quantity and quality of intellectual property as important criteria for listing key laboratories, key scientific research bases, evaluation of professional titles and promotion.”</i></p> <p>Section 3, part 4, Paragraph 1: <i>“Further strengthen the overall ability to develop intellectual property of the Park...Encourage enterprises to have larger quantity and better quality of intellectual property, focus on strengthening the layout of intellectual property, and try hard to enact an intellectual property strategy.”</i></p>
<p>Chongqing</p>	<p><i>IP Plan issued in 2011</i></p> <p>Section 4, Part 3, Paragraph 2: <i>“Explore and establish patent, trademark, and copyright, rights of new plant varieties and other intellectual property development and economic development of statistical quality monitoring system.”</i></p> <p>Section5, Part1, Paragraph5: <i>“...Intellectual property rights and industry development, intellectual property rights and the development of the national economy statistical quality monitoring and other significant propositions to carry out study and to provide reference for government sectors in formulating industry development planning and policy. Set up a research center for industrial intellectual property.”</i></p>	<p>None</p>
<p>Fujian</p>	<p>None</p>	<p><i>IP Strategy issued in 2010, targets for the following 5 years:</i></p> <p>Section1, Part1, Paragraph1: <i>“By 2020, the development index for intellectual property of Fujian Province to rank front tier in the country, the quantity and quality of intellectual property should improve significantly....”</i></p>
<p>Gansu</p>	<p><i>IP Plan issued in 2011</i></p>	<p><i>IP Strategy issued in 2010</i></p>

	<p>Section3, Part3, Paragraph6: <i>"...The quantities of patent applications and authorisation have an average yearly improvement of over 20%, and the quality of the patents has evidently improved....The conversion rate of the patented technology in the province has soared; the contribution rate of patents toward economic development has been further improved."</i></p> <p>Section5, Part6, Paragraph2: <i>"Perfecting the evaluation system: Ensure good statistical monitoring. Put the quantity, quality, and benefit from implementation of intellectual property, and the development conditions of the intellectual property management system into the evaluation index system..."</i></p>	No explicit mention of patent quality
Guangdong	<p><i>IP Plan issued in 2011</i></p> <p>Section 3, Part 1, Article 1: <i>"...Guide the intellectual property rights from the emphasis on quantity to improve the quality change."</i></p>	<p><i>IP Strategy issued in 2007, targets by the year of 2010</i></p> <p>Section2, Part4: <i>"Guiding ideology: Take improving the quality of intellectual property right as the theme."</i></p> <p>Section2, Part6: <i>"Development Goals: Set up intellectual property creation system in accordance to the development patterns of the communist market, set up a multi-layer and omni-directional protection system for intellectual property, multi-functional service system for intellectual property, to realise correspondent indigenous intellectual property rights, quantity and quality of independently developed brands and the level of economic and social development, and the ability of indigenous innovation and competitiveness of the industry make significant progress."</i></p> <p>Section2, Part7, Paragraph1: <i>"Strategic focus: Further improve the quality of development. Promote indigenous innovation, develop intellectual property rights, further expand the number of intellectual property rights, improve the quality of IPR, and optimise the structure of IPR."</i></p>

<p>Guangxi</p>	<p><i>IP Plan issued in 2011</i></p> <p>No explicit mention of patent quality</p>	<p><i>IP Strategy issued in 2009, targets by the year of 2020:</i></p> <p>Section1, Part3: <i>“Strategic goals: raise public awareness of intellectual property rights, conquer a number of key technologies and form indigenous intellectual property in major industry areas with local advantages; the quantity and quality of indigenous Intellectual Property Rights can effectively carry the goal of building an innovative Guangxi, the promotional effect of IPR on the economic and social development to be significantly enhanced.”</i></p>
<p>Guizhou</p>	<p><i>IP Plan issued in 2011</i></p> <p>No explicit mention of patent quality</p>	<p><i>IP Strategy issued in 2006, targets for every year from 2006 to 2015</i></p> <p>No explicit mention of Patent quality</p>
<p>Hainan</p>	<p><i>IP Plan issued in 2011</i></p> <p>Section 4, Article 3: <i>“...Indigenous intellectual property rights of output quantity, quality...”</i></p> <p>Section 4 Article 5: <i>“Management performance of patent work, including the amount of R&D investment, the patent owner, the quantity and quality of patent transformation, transfer, and licensing to be in the annual performance management assessment indicators to encourage innovation and excel.”</i></p>	<p><i>IP Strategy issued in 2010, targets for the following 5 years:</i></p> <p>No explicit mention of Patent quality</p>
<p>Hebei</p>	<p><i>IP Plan issued in 2011</i></p> <p>Section 3, Part 1 Paragraph2: <i>“To carry out “Major Patented Technology Industrialisation Action”; to actively promote the industrialisation of patents, and cultivate to form a certain number of patented technology projects that sustain a yearly sales income of over ten million and a hundred million yuan in selected invention patents in the province that have market potential, high efficiency and high quality...”</i></p> <p>Column5:</p>	<p><i>IP Strategy issued in 2009</i></p> <p>No explicit mention of Patent quality</p>

	<p><i>“During the 12th five year plan, select 300 high quality patented inventions, through cultivation and support, to form 10 patented technology projects that have a yearly sales income of over a hundred million yuan, to form 50 projects of over ten million yearly sales income. Select 100 SMEs with indigenous intellectual property though support and guidance, to form 50 SMEs that have yearly patented products sales’ income of over ten million yuan.”</i></p> <p>Section 3, Part 9: <i>“...introduce intellectual property innovative achievement to attract high level research and development institutions and innovation talents to settle inside the province. Actively introduce and gather good quality intellectual property resources from both within the country and abroad. Reinforce the import, digestion, absorption and innovation of patented technology....”</i></p>	
Heilongjiang	None	<p><i>IP Strategy issued in 2011, targets for the following 5 years</i></p> <p>Section 2, Part 3, Article 7: <i>“...The patent level of per unit of GDP that substantially increases in the quantity and quality which can effectively support innovative development in the province and strategic emerging industries by leaps and bounds.”</i></p>
Henan	<p><i>IP Plan issued in 2010</i></p> <p>No explicit mention of patent quality</p>	<p><i>IP Strategy issued in 2008</i></p> <p>Section2, Part8,Paragraph1: <i>“Five-year Goal: The quantity and quality of intellectual property to increase substantially.”</i></p> <p>Section3, Part10, Paragraph1: <i>“Strategic tasks for intellectual property rights of major industries: 1) Strategic supporting industries. Promote innovation of intellectual property in equipment manufacturing, motor vehicles and parts, chemical energy, Non-Ferrous Metals, food and other industries. Improve the quantity and quality of products from intellectual property innovation, and form a number of core technologies with indigenous intellectual property.”</i></p> <p>Section5, Part21, Paragraph2 <i>“Take the quantity, quality, management and application of owned intellectual property as major</i></p>

		<i>guidelines for rating innovation abilities and evaluating performances of enterprises, institutions of higher learning and scientific research institutions; take the achieved quantity and quality of intellectual property as criteria for the evaluation index system of appointment, assessment and promotion of professional titles."</i>
Hubei	<p><i>IP Plan issued in 2011</i></p> <p>Section1, part1, Article 2: <i>"...Enhance patent awareness, increase the number of patents, and patent structure, significantly improve the quality of patents; to promote patent industrialisation, the formation of a number of patent competitive industries and a group of enterprises..."</i></p> <p>Section 4 Part 3: <i>"Improve the intellectual property created by the drive mechanism to further improve patent quality."</i></p>	<p><i>IP Strategy issued in 2011</i></p> <p>No explicit mention of patent quality</p>
Hunan	<p><i>IP Plan issued in 2011</i></p> <p>No explicit mention of Patent quality</p>	<p><i>IP Strategy issued in 2009, targets by the year of 2015</i></p> <p>No explicit mention of Patent quality</p>
Inner Mongolia	None	Publicly announced that a strategy is being drafted, but is not currently available
Jiangsu	<p><i>IP Plan issued in 2011</i></p> <p>Section 2, Part 2, Paragraph 3: <i>"Pay attention to patent the mix and distribution structure of the coordinated development of different industries, focusing on the coordinated development of patent quantity and quality..."</i></p> <p>Section 4, Part 2, Paragraph 1: <i>"Strengthening catalogued evaluation on invention performances of universities and institutes...invention patent and utility models should be the key elements of evaluation on applied research, developed research...improving patent grants and rewards system, enacting the 'Measures on Patent Rewards in Jiangsu Province' to stimulate inventing and improve patent quality."</i></p>	<p><i>IP Strategy issued in 2009,targets for every year from 2009 to2013</i></p> <p>Section2,Part2, Article5: <i>"Increase the number of intellectual properties substantially, and improve their quality."</i></p> <p>Section3,Part1,Article6: <i>"...accelerate the effective combination of innovations on technology and intellectual property as well as the effective combination of intellectual property rights and the realisation of their market values to improve the created quality and operational benefit of intellectual property."</i></p> <p>Section3, Part1, Article7: <i>"Deepen the reform of the scientific research system; take the quantity and quality of indigenous intellectual property as important criteria for assessment of professional titles, promotion and rating key laboratories, key scientific research bases and other technological innovation platforms."</i></p>

Jiangxi	None	<p><i>IP Strategy issued in 2011, targets by the year of 2015</i></p> <p>Section2, Part1 Paragraph: <i>“Establish the province to become one that has a desirable environment for innovation, increasing quantity and improving quality of intellectual property...”</i></p> <p>Section 2, Part 3, Article 7: <i>“A short-term goal for 2015 is to focus on the following objectives: (1) the number of indigenous intellectual property rights to grow steadily, the quality has improved significantly.”</i></p> <p>Section 3, Article 8: <i>“Patents: Further improve the laws and regulations, and support policies, and actively promote the creation and application of balanced development. Continuously improve the quantity and quality of patent applications.”</i></p> <p>Section5, Part2, Article28: <i>“Focus on the key fields of Jiangxi’s industrial development, help to produce a number of high technology products...push forward patent products with high added value and quality to realise their ultimate industrialisation.”</i></p>
Jilin	None	None
Liaoning	<p><i>IP Plan issued in 2011</i></p> <p>Section2 Article 2: <i>“First, the steady improvement of the ownership and quality of the indigenous intellectual property rights. The average annual growth rate of the province of invented patent applications and grants to maintain the 10% level, increasing year by year compared to foreign patent applications, a considerable number of inventions in the high-tech fields has reached the international leading level and international advanced level.”</i></p> <p>Section3, part2: <i>“We shall support colleges and universities, research institutes to include the quantity, quality and application of the obtained intellectual property rights to the job classification, rank promotion and other evaluation index systems of staff and researchers, increasing the weight of the intellectual property rights in research</i></p>	<p><i>IP Strategy issued in 2011</i></p> <p>Section6, Part2, Article47: <i>“Uphold the policy that takes quantity, quality and application of intellectual properties achieved by institutions of higher learning, scientific research institutions as important criteria in the evaluation index system for faculty, staff, and scientific research personnel to be appointed, assessed and promoted, increase the leverage of intellectual property on scientific research performances.”</i></p>

	<i>performance.”</i>	
Ningxia	None	<p><i>IP Strategy issued in 2011, targets by the year of 2015:</i></p> <p>Section 2, Part2, Article 5: <i>“Long-term goal: By 2020...a substantial increase in the quantity and quality of indigenous intellectual property rights...”</i></p> <p>Section 5, Part 4, Article 34: <i>“...To strengthen the institutions of higher learning, scientific research institutions intellectual property management will be made to focus on the quantity, quality and transformation of the intellectual property rights to use the situation to include science and technology awards...”</i></p> <p>Section3, Part1, Article 11: <i>“To form a number of high quality invention patents and PCT patents in stem cells and stem cell product development areas.”</i></p>
Qinghai	None	<p><i>IP Strategy issued in 2008</i> No explicit mention of Patent quality</p>
Shaanxi	<p><i>IP Plan issued in 2011</i> No explicit mention of patent quality</p>	<p><i>IP Strategy issued in 2008, targets for the following 5years:</i></p> <p>Section4, Article19: <i>“Increase the output of high technology patents, improve the quality of patent applications in Shaanxi Province, optimise the structure of patent applications”</i></p> <p>Section5, Part1, Article25: <i>“Take the quantity and quality of intellectual property rights as an important criteria for rating colleges, universities, scientific research institutions, and the assessment of professional titles, promotions and ascertaining key laboratories and key scientific research bases.”</i></p> <p>Section5, Article 39: <i>“... Set up a patent information database or patent information service station to form a large scale, high quality, and professional patent information database series...”</i></p>
Shandong	<p><i>IP Plan issued in 2011</i> No explicit mention of patent quality</p>	<p>Publicly announced that a strategy is being drafted, but not available at time of research</p>

Shanghai ⁴⁰⁷	IP Plan issued in 2011 No explicit mention of patent quality	Publicly announced that a strategy is being drafted, but not available at time of research
Shanxi	Publicly announced that a plan is being drafted, but not available at time of research	Publicly announced that a strategy is being drafted, but not available at time of research
Sichuan	None	IP Strategy issued in 2009, targets for the following 5 years: No explicit mention of Patent quality
Tianjin	<p>IP Plan issued in 2011</p> <p>Section 4, Part 6, Article 1 <i>“To further improve the quality of the number of patents... Further improve the patent subsidy policy to focus on competitive industries and strategic emerging industries, patent applications, improve patent quality, and move to expand foreign patent applications.”</i></p> <p>Section4,part7, Article 2: <i>“We shall expand the number of valid patents and improve patent quality, optimise patent structure, significantly increasing patent creation, conversion, protection, and application capabilities.”</i></p>	<p>IP Strategy issued in 2010, targets for the following 3 years:</p> <p>Section2, Article7: <i>“The number of indigenous intellectual property owned has substantially increased, the quality has significantly improved, and the effect of implementing transformation is evident.”</i></p> <p>Section3, Article9: <i>“Improve the quantity and quality of intellectual property. Try to make the ratio of intellectual properties in Coastal Urban Areas to the quantity of intellectual properties of the province correspond to its proportional occupancy in terms of GDP, and to improve the quality of intellectual property.”</i></p> <p>Section3, Article11: <i>“Take advantage of the resources for innovation, creation and pioneering work in downtown Tianjin, to create a number of high quality intellectual properties, and form a hotspot for creating intellectual property.”</i></p> <p>Section4, Article19: <i>“Formulate and implement patent work development plan and related industries to coordinate development strategy, promote innovation, increase the quantity and quality of patents, optimise the structure of the patents, and obtain a number of core patents on core technology and key technology to support advantage industries and the development of emerging industries.”</i></p> <p>Section5, Part2, Article28: <i>“Improve the innovation ability of indigenous intellectual property of enterprises...improve the quantity and quality of intellectual property....”</i></p> <p>Section5, Part2, Article29: <i>“Improve the indigenous intellectual</i></p>

		<p><i>property quality of universities, colleges and scientific research institutions. Take the achieved quantity and quality of intellectual property as important criteria for assessment of professional titles...</i></p> <p>Section5, Part6, Article43: <i>"Improve the public service platform for intellectual property. Focus on the development needs of Tianjin's advantage industries, and emerging industries, establish high quality and professional patents, trademarks, copyrights, standards and other information databases and platforms for analysis usage."</i></p>
Tibet	None	Publicly announced that a strategy is being drafted, but is not currently available
Xinjiang	None	<p><i>IP Strategy issued in 2010, targets for the following 5 years:</i></p> <p>Section 2, Article 6, paragraph 4: <i>"Adhere to increase the quantity and improve the quality of the combination. Strengthen indigenous innovation...effectively improve the quality of intellectual property creation, and enhance core competitiveness."</i></p> <p>Section2, Article7 <i>"By 2020, overall ability of intellectual property rights on the main market strengthened remarkably; the quantity and quality of intellectual property are improved to a large extent."</i></p> <p>Section2, Article8 <i>"Goal for the upcoming five year: continuously improve the quantity and quality of intellectual property."</i></p> <p>Section4, Part1, Article20: <i>"Patents. Make great effort to promote the technological innovation during the conversions of resources, to improve the quantity of patent applications, patent authorisation, patent quality and profit."</i></p> <p>Section 5, Part 3, Article 38: <i>"... The departments concerned should obtain the quantity and quality of intellectual property rights, and conversion of use into the Science and Technology Award, job</i></p>

		<i>classification, and rank promotion evaluation.”</i>
Yunnan	<i>IP Plan issued in 2011</i> Section 3, Article 2: <i>“ Development Goals: The overall goal: by 2015...significantly improve the quantity and quality of the indigenous intellectual property rights... he proportion of indigenous intellectual property goods is constantly increasing...”</i>	<i>IP Strategy issued in 2008, targets for the following 5 years from 2009</i> No explicit mention of patent quality
Zhejiang	<i>IP Plan issued in 2012</i> Section2, Part2, Paragraph1: <i>“During the 12th five year plan...further realise the improvement on the quantity and quality of patents, gradually improving the patent work mechanism and public service system. The patent system has fully illustrated its support for improving the capability of indigenous innovation via the transformation of economic development modes...”</i>	<i>IP Strategy issued in 2009</i> No explicit mention of patent quality

Source: Review of 12th Five Year Intellectual Property Rights Plans, recent IP Strategies, and equivalent plans and strategies. Note: Other articles not cited may contain provisions in some ways related to patent quality (e.g. whereas more indirect references to patent quality measures, for example provisions that discuss boosting build invention patents but that do not in the same provision mention “quality” of IPR, are not mentioned in this chart). Translations are from the European Chamber thus are unofficial.

Table 16: Patent quality-related references in the Promotion Plan for the Implementation of the National Intellectual Property Strategy in 2012

Article	Text
Part 1	<i>“1. Enhance Quality of Intellectual Property (IP)</i> <i>Mission:</i> <i>Improve IP appraisal and assessment system, enhance IP examination and management of various intellectual property rights, including patent, trademark, copyright, and new varieties of plant, guide inventors to <u>shift the focus on IP quantity to IP quality, and boost IP value...</u>” (emphasis added)</i>
Part 1, measure 1	<i>(1) <u>Revise the Assessment Index System of National Technology Invention Awards, enhance the assessment on patent quality, increase the rewards to significant technological inventions and IP rights obtained through indigenous innovation activities.(MOST)</u>” (emphasis added)</i>
Part 1, measure 2	<i>“(2) In the process of deploying major projects which are dedicated to industrialisation and technology reform, give priority and assistance to projects which obtained IP rights through indigenous innovation activities, specify the acceleration of indigenous innovation capacity building while drafting industrial policies, develop craft equipments, technology and products that have their own IPRs. (MIIT)”</i>
Part 1, measure 3	<i>“(3) Construct an appraisal and assessment system with reference to “the number of invention patents per 10,000 people”, and carry out a pilot program accordingly. (SIPO)”</i>

Part 1, measure 4	<i>“(4) Improve the system for assessing the quality of patent examination, establish an examination steering system, <u>identify the responsibilities of examination quality management</u>, improve channels for public feedback/comments on the quality of patent examination. (SIPO)” (emphasis added)</i>
Part 1, measure 5	<i>“(5) Improve the monitoring and settlement of abnormal patent application, regulate local patent subsidy, promulgate in due time further opinions on regulating patent subsidy.(SIPO)”</i>
Part 1, measure 8	<i>“(8) Improve the examination and management of new varieties of plant, formulate test guidance on new varieties of plant, revise and publish rules for examining and approving new varieties of plant, improve the quality of granted varieties. (MOA, SFA)”</i>
Part 1, measure 9	<i>“(9) With regard to major projects dedicated to national defense, provide guidance to relevant bodies that undertake the projects on how to protect IP rights, increase the quality of patent application; recruit more examiners for patent in national defense, improve examination quality control, enhance capacity of examining patents involving national defense. (PLA GAD)”</i>
Part 2, measure 13	<i>“(13) Support central state-owned enterprises to search IP information and analyse patent information in certain fields around the burgeoning strategic industries, establish a mechanism for IPR infringement alert and risk precaution within the central state-owned enterprises step by step. (SASAC, SIPO)”</i>
Part 2, measure 14	<i>“(14) Advance the establishment of patent alliances among burgeoning strategic industries, guide and set up 30 or so such alliances. (SIPO, MOST)”</i>
Part 2, measure 15	<i>“(15) Improve the green channel for patent examination, accelerate the acquirement of IPRs by burgeoning strategic industries from their innovations. (SIPO, MOST.)”</i>
Part 3	<i>“III. Promote IP Application Mission: With IP as a link among industry, academia and research community, improve the transferring and utilising mechanisms for innovative results, promulgate policies that will promote IP transference and utilisation, propel the translation of IP from laboratory to market as well as the commercialisation and industrialisation of IP.”</i>
Part 3, measure 16	<i>“(16) Promulgate the Several Opinions on Further Intensifying the Protection of Legal Rights and Interests of Inventor or Creator of Service Inventions and Promoting IP Application and Implementation. (SIPO, MOE, MOST, MIIT, MOF, MHRSS, MOA, SASAC, SAIC, NCAC, SFA, PLA GAD)”</i>
Part 3, measure 17	<i>“(17) Conduct research on the establishment of a science and technology reporting system, propel the transformation and application of IP from major national science and technology projects and other science and technology projects, take into account the level of IP protection and the effects brought about by IP transference and transformation, which shall be adopted in the criteria of administrative permission, appraisal, and acceptance check of the projects. (MOST)”</i>
Part 3, measure 18	<i>“(18) Draft the policy related to IP disposition in technical standards, the patent assessment and implementation, increase the proportion of China's IP in major international technical standards. (MIIT, MOST, AQSIQ)”</i>
Part 3, measure 19	<i>“(19) Further improve the criteria for assessing IP, intensify quality inspection on IP-related business provided by asset assessment bodies, improve the mechanism for IP assessing services for SMEs. (MOF, SIPO)”</i>

Part 3, measure 22	<i>“(22) Draft the Regulations on Service Invention (Draft), promote the commercialisation and utilization of service inventions. (SIPO, MOST)”</i>
Part 4, measure 30	<i>“(30) Draft the Opinions on Several Issues Concerning the Trial of Disputes Involving Patent Infringement, the Opinions on Several Issues Concerning the Trial of Administrative Cases Involving Patent Licensing and Confirmation....” (Supreme Court)”</i>
Part 6, measure 57	<i>“(57) Give more guidance to local governments on strategy implementation, formulate and promulgate key points for implementing local IP strategy, launch the pilot assessment on the implementation of the local IP strategy, promulgate in due time the Guidelines on Conducting Assessment on the Local IP Strategy Implementation. (SIPO, SAIC, NCAC)”</i>
Part 6, measure 58	<i>“(58) Conduct in-depth pilot assessment on IP contained in major local economic and science and technology activities, formulate guidelines on assessing IP in line with local situations. (SIPO, MOST)”</i>
Part 6, measure 59	<i>“(59) Formulate and promulgate the 12th Five-Year Special Plan on IP Work of Science and Technology Innovation. (MOST)”</i>
Part 6, measure 60	<i>“(60) Formulate specific regulations on IP management for each major project, taking into account the characteristics of each major project and also the Provisional Regulations on Intellectual Property Management of the Major National Scientific and Technological Projects. (MOST)”</i>
Part 6, measure 61	<i>“(61) Review and improve measures on managing IP in national science and technology projects. (MOST)”</i>
Part 6, measure 64	<i>“(64) Promote IP strategy analysis in major science and technology projects, formulate IP work plans in line with characteristics of each specific major project, improve systems of major projects on the registration, collection and assessment of IP information, intensify supervision, assessment and guidance on IP management in each major project. (MOST, MIIT, SIPO)”</i>
Part 6, measure 67	<i>“(67) Promote central state-owned enterprises to fully implement IP strategy, improve the system for IP management in enterprises. (SASAC, SIPO)”</i>
Part 6, measure 69	<i>“(69) Select major strategic pioneering projects under application category and major science and technology projects involving equipment R&D and manufacturing as pilot projects so as to conduct IP management throughout the projects and in formulating IP output targets and criteria of applying results. (CAS)”</i>
Part 7, measure 75	<i>“(75) Give practical support and services within industry bases, such as tracing IP information and analysing patents. (MIIT)”</i>

Source: Author’s selection of text from the *Promotion Plan for the Implementation of the National Intellectual Property Strategy in 2012*. English translation from SIPO. Note: Other articles not cited may potentially contain provisions in some ways related to patent quality issues.

Box 1: Patent quality references in China's *National Patent Development Strategy (2011-2020)*

- China will rank among the top two in the world in terms of the annual number of patents for inventions granted to the domestic applicants, and the quality of patents filed will further improve
- China will rank among the top two in the world in terms of the annual number of patents for inventions granted to the domestic applicants, and the quality of patents filed will further improve.
- We will accelerate cultivating and training a large number of patent talents with optimum structure, reasonable distribution and high quality. The quantity and quality of patent talents in enterprises will improve significantly.
- Optimise patent subsidy policy and further define the orientation to enhance patent quality, increase the number of patent ownership in foreign countries and promote transformation of self-relied innovations into property rights.

The following references also mention building up the quality of mechanisms to improve patent quality:

- The examination efficiency will be greatly raised and the examination quality will be further improved....
- The public's satisfaction with the examination quality will steadily improve.
- Establish efficient and scientific operation and management system for examination business and constantly improve examination efficiency and quality.

Source: Author's review of the *NPDS*

Chapter 1

VII.1.1 Select patent application statistics for China

Table 17: Invention patent applications in China (1996-2011), by filer, with ratios

Year	Domestic	Foreign	Total	Ratio domestic to foreign*	Ratio domestic apps. to total*	Ratio foreign apps. to total*
1996	11,471	17,046	28,517	0.7 : 1	0.4 : 1	0.6 : 1
1997	12,713	20,953	33,666	0.6 : 1	0.4 : 1	0.6 : 1
1998	13,726	22,234	35,960	0.6 : 1	0.4 : 1	0.6 : 1
1999	15,596	21,098	36,694	0.7 : 1	0.4 : 1	0.6 : 1
2000	25,346	26,401	51,747	1 : 1	0.5 : 1	0.5 : 1
2001	30,038	33,166	63,204	0.9 : 1	0.5 : 1	0.5 : 1
2002	39,806	40,426	80,232	1 : 1	0.5 : 1	0.5 : 1
2003	56,769	48,549	105,318	1.2 : 1	0.5 : 1	0.5 : 1
2004	65,786	64,347	130,133	1 : 1	0.5 : 1	0.5 : 1
2005	93,485	79,842	173,327	1.2 : 1	0.5 : 1	0.5 : 1
2006	122,318	88,172	210,490	1.4 : 1	0.6 : 1	0.4 : 1
2007	153,060	92,101	245,161	1.7 : 1	0.6 : 1	0.4 : 1
2008	194,579	95,259	289,838	2 : 1	0.7 : 1	0.3 : 1
2009	229,096	85,477	314,573	2.7 : 1	0.7 : 1	0.3 : 1
2010	293,066	98,111	391,177	3 : 1	0.7 : 1	0.3 : 1
2011	415,829	110,583	526,412	3.8 : 1	0.8 : 1	0.2 : 1

Source: SIPO statistics database; calculations. *Ratios are approximations.

Table 18: Utility model applications in China (1996-2011), by filer, with ratios

Year	Domestic	Foreign	Total	Ratio domestic to foreign*	Ratio domestic apps. to total *	Ratio foreign apps. to total *
1996	49,341	263	49,604	188 : 1	1 : 1	0 : 1
1997	49,902	227	50,129	220 : 1	1 : 1	0 : 1
1998	51,220	177	51,397	289 : 1	1 : 1	0 : 1
1999	57,214	278	57,492	206 : 1	1 : 1	0 : 1
2000	68,461	354	68,815	193 : 1	1 : 1	0 : 1
2001	79,275	447	79,722	177 : 1	1 : 1	0 : 1
2002	92,166	973	93,139	95 : 1	1 : 1	0 : 1
2003	107,842	1,273	109,115	85 : 1	1 : 1	0 : 1
2004	111,578	1,247	112,825	89 : 1	1 : 1	0 : 1
2005	138,085	1,481	139,566	93 : 1	1 : 1	0 : 1
2006	159,997	1,369	161,366	117 : 1	1 : 1	0 : 1
2007	179,999	1,325	181,324	136 : 1	1 : 1	0 : 1
2008	223,945	1,641	225,586	136 : 1	1 : 1	0 : 1

2009	308,861	1,910	310,771	162 : 1	1 : 1	0 : 1
2010	407,238	2,598	409,836	157 : 1	1 : 1	0 : 1
2011	581,303	4,164	585,467	140 : 1	1 : 1	0 : 1

Source: SIPO statistics database; calculations.*Ratios are approximations.

Table 19: Design patent applications in China (1996-2011), by filer with ratios

Year	Domestic	Foreign	Total	Ratio domestic to foreign*	Ratio domestic apps. to total*	Ratio foreign apps. to total *
1996	21,395	3,219	24,614	6.6 : 1	0.9 : 1	0.1 : 1
1997	27,456	2,957	30,413	9.3 : 1	0.9 : 1	0.1 : 1
1998	31,287	3,345	34,632	9.4 : 1	0.9 : 1	0.1 : 1
1999	37,148	2,905	40,053	12.8 : 1	0.9 : 1	0.1 : 1
2000	46,532	3,588	50,120	13 : 1	0.9 : 1	0.1 : 1
2001	56,460	4,187	60,647	13.5 : 1	0.9 : 1	0.1 : 1
2002	73,572	5,688	79,260	12.9 : 1	0.9 : 1	0.1 : 1
2003	86,627	7,427	94,054	11.7 : 1	0.9 : 1	0.1 : 1
2004	101,579	9,270	110,849	11 : 1	0.9 : 1	0.1 : 1
2005	151,587	11,784	163,371	12.9 : 1	0.9 : 1	0.1 : 1
2006	188,027	13,295	201,322	14.1 : 1	0.9 : 1	0.1 : 1
2007	253,675	13,993	267,668	18.1 : 1	0.9 : 1	0.1 : 1
2008	298,620	14,284	312,904	20.9 : 1	1 : 1	0 : 1
2009	339,654	11,688	351,342	29.1 : 1	1 : 1	0 : 1
2010	409,124	12,149	421,273	33.6 : 1	1 : 1	0 : 1
2011	507,538	13,930	521,468	36.4 : 1	1 : 1	0 : 1

Source: SIPO statistics database; calculations.*Ratios are approximations.

VII.1.2 Growth rates for patent applications in China (average annual growth rate)

Table 20: Invention patent applications: AAGR (%) of domestic and foreign applications

Year	AAGR domestic apps.	AAGR foreign apps.	AAGR domestic + foreign apps.
1997	11	23	18
1998	8	6	7
1999	14	-5	2
2000	63	25	41
2001	19	26	22
Total (%)	23	15	18
2002	33	22	27
2003	43	20	31
2004	16	33	24
2005	42	24	33
2006	31	10	21
Total (%)	33	22	27

2007	25	5	17
2008	27	3	18
2009	18	-10	9
2010	28	15	24
2011	42	13	35
Total (%)	28	5	21

Source: SIPO statistics database; calculations. Percentages are rounded.

Table 21: Utility model applications: AAGR (%) of domestic and foreign applications

Year	AAGR domestic apps.	AAGR foreign apps.	AAGR domestic + foreign apps.
1997	1	-14	1
1998	3	-22	3
1999	12	57	12
2000	20	27	20
2001	16	26	16
Total (%)	10	15	10
2002	16	118	17
2003	17	31	17
2004	4	-2	3
2005	24	19	24
2006	16	-8	16
Total (%)	15	32	15
2007	13	-3	12
2008	24	24	24
2009	38	16	38
2010	32	36	32
2011	43	60	43
Total (%)	30	27	30

Source: SIPO statistics database; calculations. Percentages are rounded.

Table 22: Design patent applications: AAGR (%) of domestic and foreign applications

Year	AAGR domestic apps.	AAGR foreign apps.	AAGR domestic + foreign apps.
1997	28	-8	24
1998	14	13	14
1999	19	-13	16
2000	25	24	25
2001	21	17	21
Total (%)	21	7	20
2002	30	36	31
2003	17	31	19
2004	17	25	18
2005	49	27	47

2006	24	13	23
Total (%)	27	26	28*
2007	35	5	33
2008	18	2	17
2009	14	-18	1
2010	21	4	20
2011	24	15	24
Total (%)	22	2	19

Source: SIPO statistics database; calculations. Percentages are rounded. *Reminder: number due to rounding.

VII.1.3 Select patent filing statistics for select EU countries

Table 23: Germany: Patents - types and filers, ratios ('96 – '98)

Country	Year	Invention Patent (Domestic)	Invention Patent (Foreign)	Ratio* (Invention Patent Domestic vs. Foreign)	Total Invention Patent (Domestic + Foreign)	Ratio* (Total [F+D] Invention Patents vs. Total Utility Models)	
Germany	1996	42,322	9,511	4.4:1	51,833	1996 - 2.3:1 1997 - 2.4:1 1998- 2.5:1	
	1997	44,438	11,291	3.9:1	55,729		
	1998	46,523	10,843	4.3:1	57,366		
	Year	Utility Model (Domestic)	Utility Model (Foreign)	Ratio* (Utility Model Domestic vs. Foreign)	Total Utility Model (Domestic + Foreign)		
	1996	19,697	2,579	7.6:1	22,276		
	1997	20,152	2,910	6.9:1	23,062		
	1998	19,887	2,654	7.5:1	22,541		

Source: WIPO statistics database; calculations.*Ratios are approximations

Table 24: Germany: Patents - types and filers, ratios ('08 – '10)

Country	Year	Invention Patent (Domestic)	Invention Patent (Foreign)	Ratio* (Invention Patent Domestic vs. Foreign)	Total Invention Patent (Domestic + Foreign)	Ratio* (Total [F+D] Invention Patents vs. Total Utility Models)	
Germany	2008	49,240	13,177	3.7 : 1	62,417	2008 - 3.7:1 2009 - 3.4:1 2010 - 3.5:1	
	2009	47,859	11,724	4.1 : 1	59,583		
	2010	47,047	12,198	3.9 : 1	59,245		
	Year	Utility Model (Domestic)	Utility Model (Foreign)	Ratio* (Utility model Domestic vs. Foreign)	Total Utility Model (Domestic + Foreign)		
	2008	14,047	3,020	4.7 : 1	17,067		
	2009	14,242	3,064	4.7 : 1	17,306		
	2010	13,694	3,311	4.1 : 1	17,005		

Source: WIPO statistics database; calculations.*Ratios are approximations

Table 25: Denmark: Patents – types and filers, ratios ('08 – '10)

Country	Year	Invention Patent (Domestic)	Invention Patent (Foreign)	Ratio*(Invention Patent Domestic vs. Foreign)	Total Invention Patent (Domestic + Foreign)	Ratio* (Total [F+D] Invention Patents vs. Total Utility Models)	
Denmark	2008	1,634	195	8.4 : 1	1,829	2008 - 7.6:1 2009 - 8.0:1 2010 - 7.5:1	
	2009	1,518	131	11.6 : 1	1,649		
	2010	1,626	142	11.5 : 1	1,768		
	Year	Utility Model (Domestic)	Utility Model (Foreign)	Ratio* (Utility Model Domestic vs. Foreign)	Total Utility Model (Domestic + Foreign)		
	2008	218	23	9.5 : 1	241		
	2009	181	26	7 : 1	207		
	2010	198	37	5.4 : 1	235		

Source: WIPO statistics database; calculations.*Ratios are approximations

Table 26: Austria: Patents – types and filers, ratios ('08 – '10)

Country	Year	Invention Patent (Domestic)	Invention Patent (Foreign)	Ratio*(Invention Patent Domestic vs. Foreign)	Total Invention Patent (Domestic + Foreign)	Ratio* (Total [F+D] Invention Patents vs. Total Utility Models)	
Austria	2008	2,298	329	7 : 1	2,627	2008 - 3.1:1 2009 - 2.8:1 2010 - 3.0:1	
	2009	2,263	292	7.8 : 1	2,555		
	2010	2,424	249	9.7 : 1	2,673		
	Year	Utility Model (Domestic)	Utility Model (Foreign)	Ratio* (Utility Model Domestic vs. Foreign)	Total Utility Model (Domestic +Foreign)		
	2008	682	179	3.8 : 1	861		
	2009	717	209	3.4 : 1	926		
	2010	678	204	3.3 : 1	882		

Source: WIPO statistics database; calculations.*Ratios are approximations

Table 27: Industrial design for selected countries

Country	Year	Industrial Design (Domestic)	Industrial Design (Foreign)	Via The Hague	Total
Germany	2008	5,025	677	239	5,941
	2009	5,220	540	140	5,900
	2010	5,553	588	144	6,285
Austria	2008	805	227	-	1,032
	2009	629	87	-	716
	2010	694	288	-	982
Denmark	2008	183	65	-	248
	2009	172	26	12	210
	2010	162	27	21	210

Source: WIPO statistics database; calculations.*Ratios are approximations

Note on data sources in Tables 23 - 27: Intellectual property data cited in above charts in this annex are taken from the WIPO Statistics Database, which is primarily based on information provided to WIPO by national/regional IP offices and data compiled by WIPO during the application process of international filings through the PCT, the Madrid System, and the Hague System. Those statistics only cover patents filed in the domestic patent applications offices of the countries listed. They do not necessarily cover patent applications filed by residents of those countries with the EPO.

Table 28: EPO filing data 2002-2011 per country of residence of the applicant

Country/Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Austria	1,151	1,240	1,327	1,459	1,564	1,784	1,797	1,940	2,218	2,351
China	1,137	1,455	1,881	2,687	4,213	5,835	6,490	8,270	12,750	16,946
Denmark	1,173	1,295	1,375	1,567	1,627	1,759	2,080	2,044	2,156	2,236
Germany	26,507	27,211	28,227	29,152	30,670	32,128	33,405	30,486	33,146	33,181

Source: EPO statistics

VII.1.4 Patent applications by entities' registration status

Table 29: Invention patent applications by entities' registration status (large- and medium-sized enterprises only*) (2006-2010)

Registration Status	2010	2009	2008	2007	2006	Sum
	Invention patent apps.					
Total	72,523	63,230	43,773	36,074	25,685	241,285
Domestic Funded Enterprises	49,909	45,694	33,507	27,741	19,000	175,851
State-owned Enterprises	5,280	4,285	2,951	1,921	1,488	15,925
Collective-owned Enterprises	738	669	698	680	549	3,334
Cooperative Enterprises	231	153	86	72	91	633
Joint Ownership Enterprises	21	17	12	45	19	114
<i>State Joint Ownership Enterprises</i>	6	10	6	38	9	69
Limited Liability Corporations	17,000	16,487	13,986	9,605	9,690	66,768
<i>State Sole Funded Corporations</i>	2,644	2,163	1,635	1,305	1,130	8,877
Share-holding Corporations Ltd.	17,915	17,588	11,540	13,073	5,257	65,373
Private Enterprises	8,659	6,343	4,177	2,312	1,885	23,376
Other Enterprises	65	152	57	33	21	328
Enterprises with Funds from Hong Kong, Macao, Taiwan	7,245	6,171	4,332	3,299	3,425	24,472
Joint-venture Enterprises	3,521	2,489	1,724	972	933	9,639
Cooperative Enterprises	83	57	26	53	481	700
Enterprises with Sole Fund	3,220	3,203	2,305	2,039	1,823	12,590
Share-holding Corporations Ltd.	421	422	277	235	188	1,543
Foreign Funded Enterprises	15,369	11,365	5,934	5,034	3,260	40,962
Joint-venture Enterprises	4,787	4,227	3,369	2,346	1,679	16,408
Cooperation Enterprises	59	70	29	148	31	337
Enterprises with Sole Fund	10,001	6,567	2,148	2,247	1,341	22,304

Share-holding Corporations Ltd.	522	501	388	293	209	1,913
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Source: China Statistical Yearbook, National Bureau of Statistics; calculations. * Data only available for large- and medium-sized enterprises, thus inferably excludes smaller enterprises.

Table 30: Patent filings by domestic Chinese entities' registration status (large- and medium sized enterprises only*) (2009)

Chinese Domestic-Funded Enterprises	Total patent apps.	Patent apps per entity as % of total applications of all large and medium sized entities	Invention apps.	Invention apps per entity % of total invention apps.	Utility and design patent apps.	Utility and design apps per entity % of total utility and design apps.	Utility and design patents as % of each entities' total apps.
State-owned Enterprises	12,135	10%	4,285	9%	7,850	10%	65%
Collective-owned Enterprises	1,411	1%	669	1%	742	1%	53%
Cooperative Enterprises	573	0%	153	0%	420	0%	73%
Joint Ownership Enterprises	99	0%	17	0%	82	0%	83%
State Joint Ownership Enterprises	72	0%	10	0%	62	0%	86%
Limited Liability Corporations	39,642	31%	16,487	34%	23,155	31%	58%
State Sole Funded Corporations	6,754	5%	2,163	5%	4,591	5%	68%
Share-holding Corporations Ltd.	36,400	29%	17,588	37%	18,812	29%	52%
Private Enterprises	29,398	23%	6,343	13%	23,055	23%	78%
Other Enterprises	648	1%	152	0%	496	1%	77%
TOTAL	127,132	100%	47,867	100%	79,265	100%	62%

Source: China Statistical Yearbook, National Bureau of Statistics, calculations. Note 1: Due to data limitations, 2009 selected as a proxy year, as all data is at least available for that year. Note 2: SOEs are distinguished from "state-joint ownership enterprises," "state sole funded enterprises," and it is not obvious from the statistics which, if any, other corporations are controlled by the state in terms of 50/50 ownership or majority ownership). *Note 3: Data only available for large- and medium-sized enterprises, thus inferably excludes smaller enterprises.

VII.1.5 Rates of patent applications “not granted” (by type, by country)

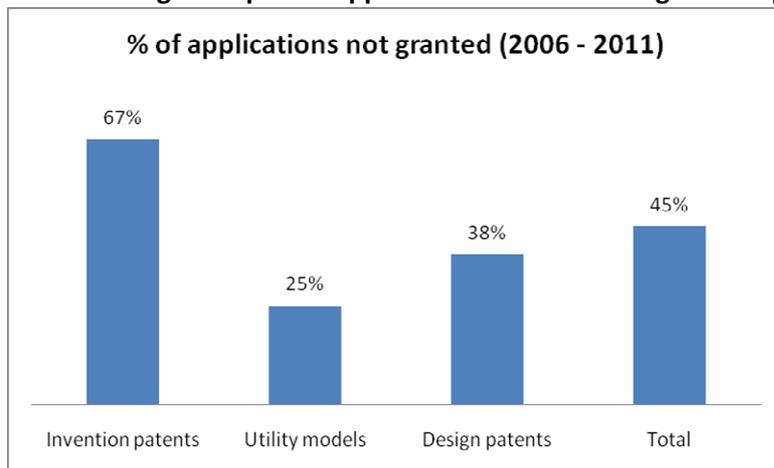
Methodology

A proxy-based approach was taken to measure the average rates of patents not being granted relative to average patent application rates. The yearly number of each type of patent applications minus the yearly number of each type of patents granted was used to create that year’s patents applied for but “not granted” figure for each type of patent. This was then taken as a percentage of each type of patents’ applications for that year. This was taken over the period of 2006-2011 (for Chart 12 below), and from 2006-2010 for Charts 13 and 14 below (whereas 2011 was not included in the latter two charts given the lack of data for some countries reviewed). Then, the average of the averages for these years was taken to create one time period average. For simplicity/readability the study presents the aforementioned figures as rates of patents “not granted.”

It should be recognised that this methodology is only intended to *very roughly* estimate the average rates of patents “not granted” because it has notable limitations. The methodology does not measure the *actual* rate of patents for which an application is filed but is ultimately not granted. This is because a patent can be filed in year X but not granted in that year but instead in year Y; this is particularly the case for invention patents given the length of their review procedure, but could apply to certain design patent and utility model filings depending on the timing of their review. As such, the figures below are inevitably skewed, although it is uncertain to what extent or direction. Also, for context, it is worth recalling the discussion in Chapter 2 of this study that there are many reasons why a patent application may ultimately not turn into a granted patent.⁴⁰⁸ Additionally, it should be noted that the data used for the European countries sampled is from filings at domestic patent offices not EPO filings.⁴⁰⁹

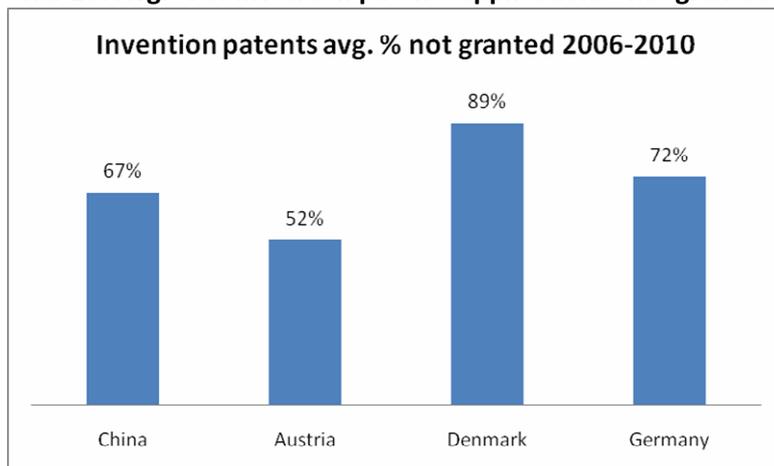
Figures

Chart 12: Avg. % of patent applications in China “not granted” per year (2006-2011)



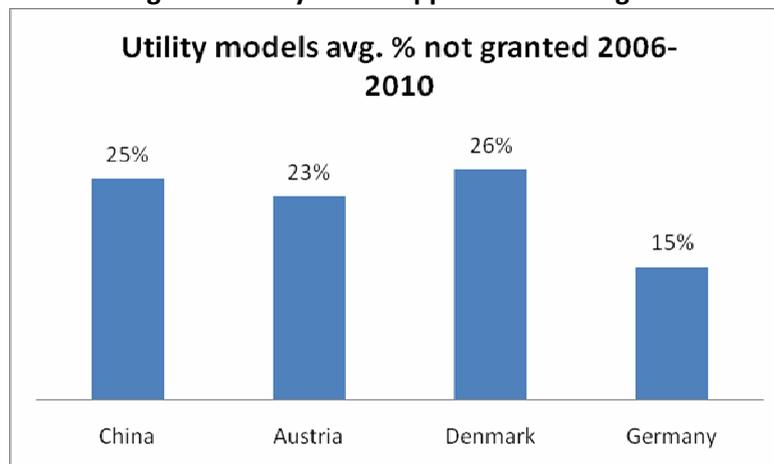
Source: SIPO statistics; calculations

Char 13: Avg. % of invention patents applications “not granted” 2006-2010, by select countries



Source: WIPO and SIPO statistics; calculations. Note: Data was not available from the WIPO source used for Austria’s 2008 rates of invention patent filings and granting rates, so the grant reflects its average for 2006-2007 plus 2009-2010.

Char 14: Avg. % of utility model applications “not granted” 2006-2010, by select countries



Source: WIPO and SIPO statistics; calculations

VII.1.6 Methodology for estimating patent filings in 2015 (by type)

Approach A

The estimates presented in Charts 6 - 8 are based on SIPO data presented earlier in this Annex and calculations using the following functions:

$$U_{app2015} = U_{app2011} \times (1 + AGR_{tu\alpha})^n$$

$$D_{app2015} = D_{app2011} \times (1 + AGR_{td\alpha})^n$$

$$I_{app2015} = I_{app2011} \times (1 + AGR_{ti\alpha})^n$$

Whereas:

- U_{app} = utility model applications
- D_{app} = design patent applications
- I_{app} = invention patent applications
- app_{2011} = number of applications in 2011
- app_{2015} = predicted number of applications in 2015
- $AGR_{tu\alpha}$ = avg. growth rate of total (foreign + domestic) utility model applications in time period (2009-2011)
- $AGR_{td\alpha}$ = avg. growth rate of total (foreign + domestic) design patent applications in time period (2009-2011)
- $AGR_{ti\alpha}$ = avg. growth rate of total (foreign + domestic) invention patent applications in time period (2009-2011)
- n = number of years from 2011-2015

These patent filing estimates were then presented in chart form, and the according percentage of total patent applications was calculated.

“Upper bound” estimates: The average growth rate from 2009-2011 (i.e. growth 2009 to 2010, and 2010 to 2011) of patent applications for each of the types of patents was used in the projections. This rate was used given it is taken from the most recent few years, and thus arguably is the most representative and factual indicator of patent growth in the near future. A longer period of time, for example from 2006-2011 was not used given this period would include patent filings in the middle of the global financial crisis, which may have at least some impact that would cause skewing of the estimates (although using figures from 2009 onwards admittedly does not completely avoid shocks of the financial crisis).

It is possible that using the growth rate from 2009-2011 will result in an upper bound estimate in patent growth given the particularly high rates of application growth in those years, which may or may not necessarily be sustained; however, even when using the compound annual growth rate over five years (see Approach B below), the results are similar. In general, given the continuous growth of total patent applications in China over the last decade, it appears reasonable to use a sampling of recent growth rates to at least roughly predict future patent application growth in China.

Approach B

“Lower bound” estimates: An alternative “lower bound” estimate is provided herein as a way of providing another approach to estimating the composition of patents in China in 2015 that might at least avoid some of the ‘over-estimating’ possible in the aforementioned upper bound estimates. The lower bound estimate is built upon a very similar approach to the upper bound estimate with some small modifications, namely (1) that the compound annual growth rate (CAGR) is used instead of the AGR, and (2) different years are used to calculate this rate. The functions for this approach are as follows:

$$Uapp_{2015} = Uapp_{2011} \times (1 + CAGR_{tu\alpha})^n$$

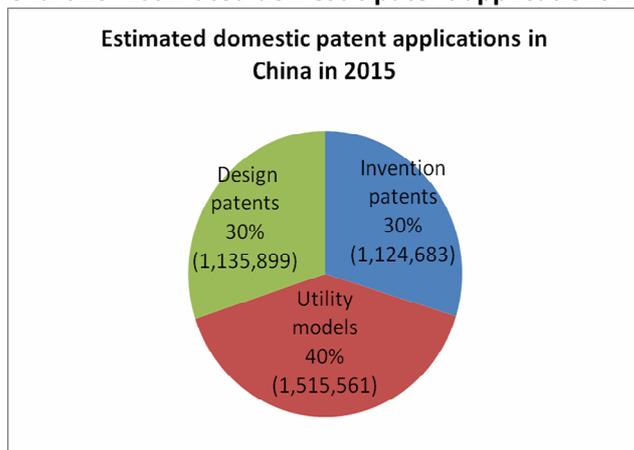
$$Dapp_{2015} = Dapp_{2011} \times (1 + CAGR_{td\alpha})^n$$

$$Iapp_{2015} = Iapp_{2011} \times (1 + CAGR_{ti\alpha})^n$$

- $CAGR_{tu\alpha}$ = CAGR of total (foreign + domestic) utility model applications in time period (2006-2011)
- $CAGR_{td\alpha}$ = CAGR of total (foreign + domestic) design patent applications in time period (2006-2011)
- $CAGR_{ti\alpha}$ = CAGR of total (foreign + domestic) invention patent applications in time period (2006-2011)

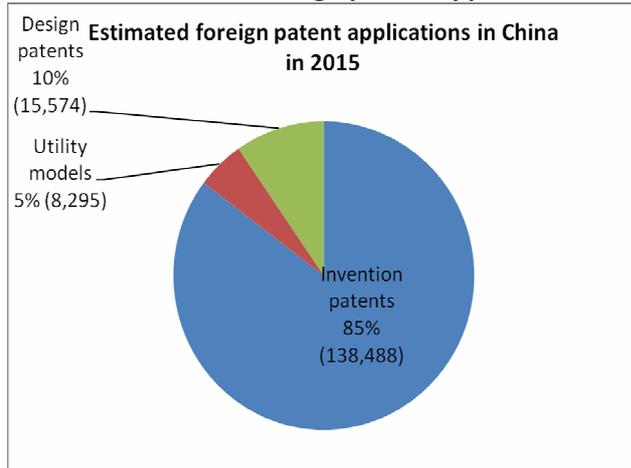
The results from this approach are illustrated below. They differ, but not dramatically, from the “upper bound” results.

Chart 15: Estimated domestic patent applications in China in 2015



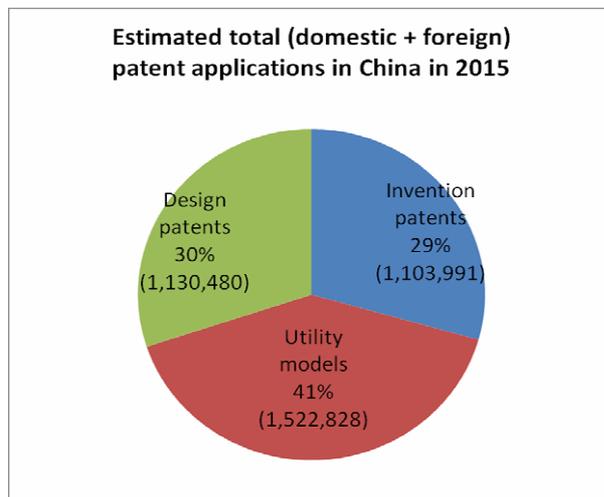
Source: Methodological Approach B

Chart 16: Estimated foreign patent applications in China in 2015



Source: Methodological Approach B

Chart 17: Estimated total (foreign + domestic) patent applications in China in 2015



Source: Methodological Approach B

Additional notes

As mentioned in the body of this study, both methodologies presented herein face limitations in their projection capacity. First, they are built upon a necessary assumption of holding all else constant, whereas this obviously does not account for dynamic effects that take place in the real economy. Second, they are based upon past growth rates, which obviously may change in the future given any number of factors.

VII.1.7 Rates of patents granted and not granted in China (2006-2011)

Table 31: Number of total patents granted in China, by type (2006-2011)

Year	Invention patents	Utility models	Design patents	All applications
2006	57,786	107,655	102,561	268,002
2007	67,948	150,036	133,798	351,782
2008	93,706	176,675	141,601	411,982
2009	128,489	203,802	249,701	581,992
2010	135,110	344,472	335,243	814,825
2011	172,113	408,110	380,290	960,513

Source: SIPO statistics

Table 32: % of patent applications in China not granted (2006-2011)

Year	Invention patents	Utility models	Design patents	% of all apps. not granted
2006	73	33	49	53
2007	72	17	50	49
2008	68	22	55	50
2009	59	34	29	40
2010	65	16	20	33
2011	67	30	27	41
Avg.	67	25	38	45

Source: SIPO statistics; calculation

VII.1.8 Patents in-force in China (2006-2011)

Table 33: Foreign patents in-force by type

	Total patents	Invention patents	Utility models	Design patents
2006	178,467	145,981	4,291	28,195
2007	227,634	176,239	4,779	46,616
2008	271,399	209,619	6,387	55,393
2009	326,913	257,994	7,013	61,906
2010	390,679	306,867	8,514	75,298
2011	436,891	345,651	10,638	80,602

Source: SIPO statistics

Table 34: Domestic patents in-force by type

	Total patents	Invention patents	Utility models	Design patents
2006	548,758	72,941	288,032	187,785
2007	622,409	95,678	294,463	232,268
2008	923,797	127,596	463,342	332,859
2009	1,193,110	180,042	558,791	454,277
2010	1,825,403	257,893	849,454	718,056
2011	2,383,617	351,288	1,109,958	922,371

Source: SIPO statistics

VII.1.9 R&D expenditures by entities' registration status (large- and medium-sized enterprises)

Table 35: R&D expenditures by entities' registration status (large- and medium-sized enterprises*) (2006-2010)

Registration Status	2010 Expenditure on R&D (10,000 yuan)	2009 Expenditure on R&D (10,000 yuan)	2008 Expenditure on R&D (10,000 yuan)	2007 Expenditure on R&D (10,000 yuan)	2006 Expenditure on R&D (10,000 yuan)	Avg annual exp. 2006-2010 (10,000 yuan)
Total	40,153,965	32,115,692	26,813,110	21,124,561	16,301,909	27,301,847
Domestic Funded Enterprises	29,671,163	23,449,930	19,520,725	14,972,444	11,857,649	19,894,382
State-owned Enterprises	3,922,823	3,222,891	2,691,952	1,820,905	1,649,808	2,661,676
Collective-owned Enterprises	463,524	436,754	386,658	390,744	382,390	412,014
Cooperative Enterprises	209,568	96,938	107,765	113,940	62,517	118,146
Joint Ownership Enterprises	82,453	73,116	109,447	118,524	137,099	104,128
State Joint Ownership Enterprises	73,863	66,431	107,211	110,254	130,032	97,558
Limited Liability Corporations	13,533,642	10,793,313	8,734,622	7,095,938	5,648,069	9,161,117
State Sole Funded Corporations	3,696,351	3,111,622	2,363,456	2,501,971	1,945,024	2,723,685
Share-holding Corporations Ltd.	7,269,785	5,510,394	5,070,523	3,777,023	2,916,028	4,908,750
Private Enterprises	4,124,654	3,218,079	2,339,685	1,476,612	1,052,648	2,442,336
Other Enterprises	64,714	98,446	80,075	178,758	9,090	86,217
Enterprises with Funds from Hong Kong,	3,574,987	3,123,358	2,235,951	1,833,414	1,456,934	2,444,929

Macao & Taiwan						
Joint-venture Enterprises	1,479,475	1,433,202	987,193	766,590	560,266	1,045,345
Cooperative Enterprises	44,994	37,646	14,817	38,314	36,221	34,398
Enterprises with Sole Fund	1,595,856	1,424,288	1,022,192	809,004	700,728	1,110,414
Share-holding Corporations Ltd.	454,662	228,222	211,750	219,506	159,719	254,772
Foreign Funded Enterprises	6,907,815	5,542,403	5,056,433	4,318,703	2,987,327	4,962,536
Joint-venture Enterprises	3,582,738	2,909,361	2,966,218	2,363,226	1,498,878	2,664,084
Cooperation Enterprises	81,526	57,509	25,508	51,672	23,088	47,861
Enterprises with Sole Fund	2,652,860	2,031,581	1,649,379	1,467,684	1,096,495	1,779,600
Share-holding Corporations Ltd.	590,692	543,952	415,328	436,121	368,866	470,992

Source: China Statistical Yearbook, National Bureau of Statistics; calculations.*Note: Data only available for large- and medium-sized enterprises, thus excludes smaller enterprises.

VII.1.10 Number of R&D personnel in entities in China by registration status (large and medium-sized enterprises)

Table 36: Number of R&D personnel in entities in China by registration status (large and medium-sized enterprises*) (2006-2010)

Registration Status	Equivalent of R&D Personnel (man-year)					Avg. number of R&D personnel employed (annually (2006-2010))
	2010	2009	2008	2007	2006	
Total	1,369,908	1,306,179	1,014,223	857,650	695,668	1,048,726
Domestic Funded Enterprises	970,605	952,103	767,296	657,374	553,558	780,187
State-owned Enterprises	138,539	141,029	115,427	101,793	93,889	118,136
Collective-owned Enterprises	7,256	9,748	8,157	8,127	8,206	8,299
Cooperative Enterprises	5,120	4,508	3,111	3,506	3,220	3,893
Joint Ownership Enterprises	2,730	1,901	1,423	1,793	2,394	2,048
<i>State Joint Ownership Enterprises</i>	1,782	1,636	1,262	1,414	1,921	1,603
Limited Liability Corporations	423,951	418,484	349,231	312,422	273,193	355,456
<i>State Sole Funded Corporations</i>	111,268	116,775	89,299	96,537	98,853	102,546
Share-holding Corporations Ltd.	235,926	238,715	190,748	156,206	119,909	188,301
Private Enterprises	154,404	134,941	97,150	68,324	52,040	101,372
Other Enterprises	2,678	2,778	2,047	5,204	707	2,683
Enterprises with Funds from Hong Kong, Macao & Taiwan	149,554	136,209	85,512	71,602	49,583	98,492
Joint-venture Enterprises	61,466	56,697	36,766	27,856	20,177	40,593
Cooperative Enterprises	1,994	1,993	946	1,968	1,481	1,676

Enterprises with Sole Fund	74,147	66,530	40,331	35,125	22,991	47,825
Share-holding Corporations Ltd.	11,947	10,990	7,469	6,654	4,934	8,399
Foreign Funded Enterprises	249,750	217,866	161,415	128,673	92,527	170,046
Joint-venture Enterprises	100,614	95,067	74,980	57,537	39,863	73,612
Cooperation Enterprises	1,995	1,613	1,192	1,149	760	1,342
Enterprises with Sole Fund	130,259	100,758	67,818	56,353	39,507	78,939
Share-holding Corporations Ltd.	16,882	20,428	17,425	13,633	12,397	16,153

Source: China Statistical Yearbook, National Bureau of Statistics; calculations. *Note: Data only available for large- and medium-sized enterprises, thus excludes smaller enterprises.

Chapter 2

VII.2.1 Quantitative patent targets from major recently-promulgated Chinese policy documents

Note: The provisions translated in this Annex are meant only to discuss patent-specific targets. This Annex does not include an illustration of different closely but more indirectly related quantitative targets that may be in some of the policy statements referenced.⁴¹⁰

VII.2.1.1 Box 8: Key patent targets from the *S&T MLP*

- By 2020, China to be among the top five countries in the world in terms of annual invention patents granted to Chinese nationals

Source: China's *S&T MLP*

VII.2.1.2 Box 9: Key patent targets from China's nationwide *12th Five Year Plan*

- Invention patents owned should be increased from 1.7 to 3.3 per ten thousand people by 2015

Source: China's nationwide *12th Five Year Plan*

VII.2.1.3 Box 10: Key patent targets from China's *NPDS (2011-2020)*

- 2 million annual patent filings by 2015
- Approximately double the patent examiner workforce to 9,000
- Number of invention patents per every one million people and the number of patent applications in foreign countries will quadruple
- Market entities will be much better at the creation, utilisation, protection and administration of patents
- The proportion of patent applications in industrial enterprises above the designated size will reach 10%
- China will rank among the top two in the world in terms of the annual number of patents for inventions granted to the domestic applicants, and the quality of patents filed will further improve
- The number of patents owned per every one million people and the number of overseas patent applications filed by Chinese applicants will double
- The proportion of patent applications in industrial enterprises above the designated size will reach 8% and the quantity owning patent rights will significantly rise
- 10 model cities that can comprehensively utilise the patent system and have excellent intellectual property market environment will be established
- For reference although not a quantitative target: a large number of core patents will be acquired in some key fields of emerging industries and in key technological fields of traditional industries

Source: Author's review of *NPDS*

VII.2.1.4 Box 11: Key patent targets in the SC's Notice on IPR in Strategic Emerging Industries

- By 2015, triple the number of the invention patents owned in strategic emerging industries compared to the number in 2010
- By 2015, triple the number of international patent applications in strategic emerging industries compared to the number in 2010

Source: SC's Notice on IPR in Strategic Emerging Industries. Note: Translations are from the European thus are unofficial.

VII.2.1.5 Table 37: Patent targets from major and recently promulgated sub-national IP plans and strategies

Province/ Municipality/ Autonomous Region	12 th Five Year IP Plans and/or equivalent plans	Provincial IP Strategies and/or other equivalent strategies
Anhui	<p><i>IP Plan issued in 2011, targets for every year from 2011 to 2015:</i></p> <ul style="list-style-type: none"> • Patent applications = 20% annual growth rate • Patent applications granted = 20% annual growth rate <p><i>By the year of 2015:</i></p> <ul style="list-style-type: none"> • Annual patent applications ≥ 80,000 • Annual patents granted ≥ 40,000 • Invention patents owned = 3.4 per ten thousand people • The proportion of enterprises patent applications accounts for over 60% of total patent applications <p><i>Targets for the year of 2012 (from 2012 patent implementation measure):++</i></p> <ul style="list-style-type: none"> • Patent applications granted = 30% full-year growth • Invention Patent applications granted =40% full-year growth 	No publicly available strategy
Beijing	<p><i>Beijing's IP Plan issued in 2011, targets by the year of 2015:</i></p> <ul style="list-style-type: none"> • Patent applications issued respectively reach up to approximately 37 and 17 per ten thousand people • Invention patent applications and granted patents respectively will reach 20 and 8 per ten thousand 	*General targets only

	<p>people, keeping the top position nationwide</p> <p><i>Beijing's 12th Five Year Blueprint, targets by the year of 2015</i></p> <ul style="list-style-type: none"> ▪ Invention patent applications ≥ 22 per ten thousand people • Invention patents granted up to 8 per ten thousand people • PCT international patent applications up to 0.55 per ten thousand 	
Chongqing	<p><i>IP Plan issued in 2011, targets by the year of 2015:</i></p> <ul style="list-style-type: none"> • Annual patent applications ≥ 70,000 • Annual patents granted ≥ 37,000 • Annual invention patents granted ≥ 4,000 • Invention patent owned = 3.8 per ten thousand people • Total output value of patented products worth ≥ 1 trillion yuan • Over 50% of the emerging strategy industries own key patent technologies 	No publicly available strategy
Fujian	No publicly available plan	<p><i>IP Strategy issued in 2010, targets for the following 5 years:</i></p> <ul style="list-style-type: none"> • Patent applications and granted ≥ 12% annual growth rate • Invention patent applications and granted ≥ 15% annual growth rate • The proportion of foreign patent applications account for over 2% of the total annual patent applications
Gansu	<p><i>IP Plan is issued in 2011, targets for every year from 2011 to 2015:</i></p> <ul style="list-style-type: none"> • Patent applications ≥ 20% annual growth rate • Patent applications granted ≥ 20% annual growth rate • Over 70% of the enterprises in the high-tech development zones, economic and technological development zones and industrial parks own patents 	*General targets only
Guangdong	<i>IP Plan issued in 2011, targets by the year of 2015:</i>	<i>IP Strategy issued in 2007, targets by the year of 2010:</i>

	<ul style="list-style-type: none"> • Patent applications ≥ 10% annual growth rate • Patent applications = 2,200 per million people • Invention patent applications ≥ 13% annual growth rate • Invention patent applications = 700 per million people • Number of patents granted ≥ 13% annual growth rate • Number of invention patent granted ≥ 15% annual growth rate • Double PCT international patent applications 	<ul style="list-style-type: none"> • Patent applications ≥ 13% annual growth rate • Patent applications = 1,250 per million people • Invention patent applications = 200 per million people • Invention patent applications ≥ 15% annual growth rate • Foreign patent applications ≥ 20% annual growth rate⁴¹¹ <p>General long-term targets by the year 2020 are also included</p>
Guangxi	<p><i>Technology and Science Development Plan is issued in 2011, targets by the year of 2015:</i></p> <ul style="list-style-type: none"> • Invention patents owned up to 3 per ten thousand people 	<p><i>IP Strategy issued in 2009, targets by the year of 2020:</i></p> <ul style="list-style-type: none"> • Patent applications ≥ 20% annual growth rate • Invention patent applications ≥ 25% annual growth rate • The number of major invention patents in the key competitive industries ≥ 500
Guizhou	<p><i>IP Plan is issued in 2011, targets by the year of 2015</i></p> <ul style="list-style-type: none"> • Patent applications ≥ 35% annual growth rate • Number of patent applications granted ≥ 30% annual growth rate • Service invention-creation applications = 60% • 100 international patent applications 	<p><i>IP Strategy issued in 2006, targets for every year from 2006 to 2015</i></p> <ul style="list-style-type: none"> • Patent applications and granted ≥ 15% annual growth rate <p><i>By the year of 2020</i></p> <ul style="list-style-type: none"> • The proportion of invention patents accounts for over 35% of total patent applications • The proportion of service invention-creations accounts for 60% of total invention patent applications
Hainan	<p><i>IP Plan issued in 2011, targets by the year of 2015:</i></p> <ul style="list-style-type: none"> • Patent applications ≥ 15% annual growth rate • Simultaneous increase in patents applications and those granted • Annual patent applications granted ≥ 600 • Proportion of invention patent applications ≥ 40% of total patent applications • Significantly increase foreign patent applications 	<p><i>IP Strategy issued in 2010, targets for the following 5 years:</i></p> <ul style="list-style-type: none"> • The total number of patent applications accounts for 16,000 • Patent applications ≥ 15% annual growth rate • Invention patent applications ≥ 1/3 of total patent applications • Industrial enterprises' patent conversion rate ≥ 75%

Hebei	<i>IP Plan issued in 2011, targets by the year of 2015:</i> <ul style="list-style-type: none"> • Annual patent applications = 25,000 • Patent applications ≥ 12% annual growth rate • Annual invention patent applications = 8,000 • Invention patent applications ≥ 15% annual growth rate 	<i>IP Strategy issued in 2009, targets by the year of 2013:</i> ⁴¹² <ul style="list-style-type: none"> • Patent applications ≥ 15% annual growth rate • Annual patent applications ≥ 20,000
Heilongjiang	<p style="text-align: center;">No publicly available plan</p>	<i>IP Strategy issued in 2011, targets for the following 5 years</i> <ul style="list-style-type: none"> • Patent applications = 20% annual growth rate <p><i>By the end of the 12th 5 years</i></p> <ul style="list-style-type: none"> • Invention patents owned ≥ 2.1 per ten thousand people • Number of patent-competitive companies able to use the intellectual property rights to participate in market competition ≥ 200 <p><i>Targets for the year of 2012 (from 2012 IP implementation measure):††</i></p> <ul style="list-style-type: none"> • The number of patent applications ≥ 20,000 • The number of enterprises patent applications = 5,000 • The number of patent applications of universities and research institutes = 4,200
Henan	<i>IP Plan issued in 2010, targets by the year of 2015:</i> <ul style="list-style-type: none"> • Annual patent applications ≥ 30,000 • Annual patent applications granted ≥ 20,000 • Proportion of invention patent applications ≥ 30% of total patent applications • Proportion of service invention-creation applications ≥ 60% of total patent applications 	*General targets only
Hubei	<i>IP Plan issued in 2011, targets for every year from 2011 to 2015:</i> <ul style="list-style-type: none"> • Annual growth rates of patent applications and patents granted to be ≥ 15% 	*General targets only

	<p><i>By the year of 2015</i></p> <ul style="list-style-type: none"> • Invention patent applications and granted patents to be one time more than the amount of those in 2010 • Invention patents granted to reach up to 0.5 per ten thousand people 	
Hunan	<p><i>IP Plan issued in 2012, targets by the year of 2015:</i></p> <ul style="list-style-type: none"> • Annual patent applications \geq 40,000 • Average annual patent applications growth \geq12% • Dominant regions \geq 20% of Hunan Province • Annual patents granted = 3.5 per ten thousand people • Invention patents granted to reach up to 1.6 per ten thousand people, with 3.3 in dominant regions 	<p><i>IP Strategy issued in 2009, targets by the year of 2015</i></p> <ul style="list-style-type: none"> • Annual patent applications \geq 30,000 • Patent applications \geq 12% annual growth rate • Dominant regions \geq 20% of Hunan Province • The percentage of patents owned by enterprises in industrial zones \geq 90% • Industrial enterprises' patent conversion rate \geq70% • All high-tech enterprises and backbone enterprises own patents • Industrial enterprises above designated size with indigenous intellectual property products output value as accounted for in GDP \geq 30% • Independent intellectual property rights and indigenous brands' exports \geq 20% and \geq 50% of total export volume
Inner Mongolia	No publicly available plan	Publically announced that a multi-year strategy is being drafted, but is not currently available (mention of strategy in 2012 work plan) ⁴¹³
Jiangsu	<p><i>IP Plan issued in 2011, targets by the year of 2015</i></p> <ul style="list-style-type: none"> • Invention patents owned = 6 per ten thousand people • Invention patents granted to employers in high-tech parks \geq 100 • Number of patents issued = 400 per ten billion RMB GDP • PCT international patent applications \geq 1,000 • Double the number of the effective patents owned and the total number of invention patent granted compared with 	<p><i>IP Strategy issued in 2009, targets for every year from 2009 to 2013</i></p> <ul style="list-style-type: none"> • Patent applications and granted \geq 15% annual growth rate • Invention patent applications \geq 20% annual growth rate • Foreign patent applications \geq 30% annual growth rate • The proportion of enterprises patent applications accounts for 55% of total patent applications

	those of “11 th 5year Plan”	
Jiangxi	No publicly available plan	<i>IP Strategy issued in 2011, targets by the year of 2015</i> <ul style="list-style-type: none"> • Patent applications ≥ 20% annual growth rate • The total number of invention patents owned ≥13,932
Jilin	No publically available province-wide plan (although a city plan for Changchun, Jilin, for example, is available) ⁴¹⁴	No publically available multi-year strategy (although a 2012 strategy, with no quantitative targets, exists) ⁴¹⁵
Liaoning	<i>IP Plan issued in 2011, targets by the year of 2015:</i> <ul style="list-style-type: none"> • Invention patent applications and invention patents granted = 14% annual growth rate • Invention patents owned- no less than 3.3 per million people 	<i>IP Strategy issued in 2008, targets for the following 5 years:</i> <ul style="list-style-type: none"> • Invention patent applications and invention patents granted = 10% annual growth rate
Ningxia	No publicly available plan	<i>IP Strategy issued in 2011, targets by the year of 2015:</i> <ul style="list-style-type: none"> • Patent applications and granted ≥ 15% annual growth rate • Invention patent applications and granted ≥ 30% annual growth rate • Industries with advantages locally to apply for ≥ 2000 invention patents • Quadruple the number of invention patents owned per ten thousand people
Qinghai	No publicly available plan	*General targets only ⁴¹⁶
Shaanxi	<i>IP Plan is issued in 2011, targets for every year from 2011 to 2015:</i> <ul style="list-style-type: none"> • Patent applications = 18% annual growth rate • Invention patent applications = 20% annual growth rate • PCT international patent application = 25% annual growth rate <i>By the year of 2015</i> <ul style="list-style-type: none"> • The total patent applications ≥ 50,000 in 2015 • Number of invention patent granted = 2.5 per ten thousand people • Number of invention patent 	<i>IP Strategy issued in 2008, targets for the following 5years:</i> <ul style="list-style-type: none"> • Annual patent applications ≥ 15,000 • Annual patent applications granted ≥ 6,000 • Invention patent applications accounts for ≥ 40% of total patent applications • Service patents applications accounts for ≥ 60% of total patent applications • Industries patent applications accounts for ≥ 40% of total patent applications

	owned = 3.3 per ten thousand people	
Shandong	<p><i>IP Plan issued in 2011, targets by the year of 2015:</i></p> <ul style="list-style-type: none"> • 80% of the industrial enterprises above the designated size have patent applications • Double the number of annual invention patents applications granted per ten thousand people • Double the number of the annual valid invention patents owned per ten thousand people <p>Other more general targets⁴¹⁷</p>	Publically announced that a strategy is being drafted, but is not currently available
Shanghai	<p><i>IP Plan issued in 2011, targets by the year of 2015</i></p> <ul style="list-style-type: none"> • Invention patents granted = 600 per million people • Invention patents owned = 30 per ten thousand people • Greatly increase PCT international patent applications 	Publically announced that a strategy is being drafted, but is not currently available
Shanxi	Publically announced that a plan is being drafted, but is not currently available ⁴¹⁸	Publically announced that a strategy is being drafted, but is not currently available
Sichuan	No publicly available plan	<p><i>IP Strategy issued in 2009, targets for the following 5 years:</i></p> <ul style="list-style-type: none"> • Patent applications and granted $\geq 12\%$ annual growth rate • Invention patent applications $\geq 15\%$ annual growth rate • The proportion of patent applications by enterprises increases to $\geq 30\%$ of total patent applications <p><i>Targets for the year of 2012 (from 2012 patent development measure):++</i></p> <ul style="list-style-type: none"> • Patent applications = 15% full-year growth • Invention patent applications = 18% full-year growth • Enterprises patent applications = 20% full-year growth
Tianjin	<p><i>IP Plan issued in 2011, targets by the year of 2015:</i></p> <ul style="list-style-type: none"> • Invention patent owned = 9 per 	<p><i>IP Strategy issued in 2010, targets for the following 3 years:</i></p> <ul style="list-style-type: none"> • The total number of patent

	<p>ten thousand people</p> <ul style="list-style-type: none"> • Annual patent applications= 50,000 • Patent applications granted=20,000 • Double the total number of proprietary intellectual property rights 	<p>applications \geq 200,000</p> <ul style="list-style-type: none"> • The total number of valid patents \geq 40,000, with valid invention patents accounts for 1/3 of the total number of valid patents • The proportion of valid patents accounts for over 60% of the total enterprises patents • The number of enterprises owning patents accounts for 5,000 • The total number of foreign patent applications accounts for 1,000 <p><i>Targets for the year of 2012 (from 2012 IP implementation measure):††</i></p> <ul style="list-style-type: none"> • The number of patent applications = 40,000 • The number of invention patent applications = 12,000 • The number of patent applications granted = 15,000 • Invention patents owned \geq 7.5 per ten thousand people • The number of patent applications of Binhai New Area = 13,000 • The number of patent applications of strategic emerging industries = 2,000 • Patents in force owned by pilot zone \geq 30% full-year growth • The number of patent applications of pilot zone = 2,000
Tibet ⁴¹⁹	No publicly available plan	No publicly available strategy Publically announced that a strategy is being drafted, but is not currently available ⁴²⁰
Xinjiang	See strategy column to the right	<p><i>IP Strategy issued in 2010, targets for the following 5 years:</i></p> <ul style="list-style-type: none"> • Patent applications \geq 15% annual growth rate • Patents applications granted \geq15% annual growth rate <p><i>†Promotion Plan of Xinjiang IP Strategy (2011-2015), targets during 2011-2015:</i></p> <ul style="list-style-type: none"> • Patent applications and granted \geq 25% annual growth rate • Patent applications = 30,000 • Patent applications granted = 18,000 • The proportion of invention patents

		<p>accounts for over 35% of the total patent applications</p> <p><i>By the year of 2015:</i></p> <ul style="list-style-type: none"> • Invention patents owned = 1.09 per ten thousand people <p>*Other general targets</p> <p><i>Targets by the end of 2012 (from 2012 IP implementation measure)††</i></p> <ul style="list-style-type: none"> • The number of patent applications = 5,500 • The number of patent applications granted = 3,800
Yunnan	<p><i>IP Plan issued in 2011, targets by the year of 2015</i></p> <ul style="list-style-type: none"> • The growth number of patent applications = 25,000 • The growth number of invention patent applications = 8,500 • The growth number of invention patents granted = 2,500 • Enterprise patent applications ≥ 15% annual growth rate • Enterprise patents granted ≥ 15% annual growth rate 	<p><i>IP Strategy issued in 2008, targets for the following 5 years from 2009</i></p> <ul style="list-style-type: none"> • The growth number of patent applications = 22,000 • The growth number of patent applications granted = 11,000
Zhejiang	<p><i>IP Plan issued in 2012, targets for every year from 2011 to 2015</i></p> <ul style="list-style-type: none"> • Patent applications = 15% annual growth rate • Patent application granted = 15% annual growth rate • Invention patents granted = 25% annual growth rate <p><i>By the year of 2015</i></p> <ul style="list-style-type: none"> • Double the total number of patent applications and patents granted • Total number of invention patents granted = 20,000 • Double the number of registrations of invention patents per ten thousand people 	<p>*General targets only</p>

Source: Author's review of readily available provincial/municipal 12th Five Year IP Plans and equivalent plans, and recent IP Strategies and equivalent strategies. Translations are from the European Chamber thus are unofficial. Note 1: The targets herein are based on the express provisions in the policies collected, whereas other targets may exist. Note 2: *Xinjiang's IP Promotion Plan herein is included as it spans five years. ††Note 3: These one-year implementation plans included even though they are not multi-year as they mention specific quantitative targets ostensibly for implementing the multi-year plans/strategies. Note 4: Although not all include quantitative patent development targets, it is worth noting that a one year 2012 IP promotion plan (called a Provincial/ Municipal 2012 *Major Tasks on the Implementation of IP Strategy*) has been issued for the following provinces/municipalities: Beijing, Fujian, Gansu, Guangdong, Hebei, Heilongjiang, Henan,

Hubei, Hunan, Inner Mongolia, Jiangsu, Jilin, Liaoning, Ningxia, Qinghai, Shandong, Shanghai, Shanxi, Tianjin, Xinjiang, and Yunnan; and a *2012 Major Tasks of Intellectual Property (Patent) Work* has been issued for Anhui and Sichuan. Note 5: *The following provinces state a will to greatly increase the foreign patent applications in their 12th Five Year IP Plans: Henan, Tianjin, Liaoning, and Zhejiang; and the following state such a will in their IP Strategies: Gansu, Guangdong, Guizhou, Henan, Heilongjiang, Hubei, Hunan, Liaoning, Ningxia, Qinghai, Sichuan, and Yunnan. The following provinces state a desire to develop key patents in patent-competitive industries within their province within their 12th Five Year IP Plans: Guangdong, Hainan, Hubei, Jiangsu, Jiangxi, and Shaanxi; and the following state such a desire in their IP Strategies: Beijing, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Tianjin, Xinjiang, and Zhejiang.

VII.2.2 Example IP indicators in performance evaluations for research institutes, SOEs, enterprises, Party and other government officials, and others

Table 38: EXAMPLE IP indicators in performance evaluations from China’s Provincial/Municipal 12th Five Year Plans on Intellectual Property, recent IP Strategies, and equivalent plans

Province/ Municipality/Autonomous Region	Performance-evaluation indicators from 12 th Five Year IP Plans, other equivalent plans , Provincial IP Strategies and other equivalent plans
Anhui	<ul style="list-style-type: none"> • <i>IP Plan issued in 2011:</i> Section 5, Para1: <i>“Improve intellectual property coordination mechanism, and gradually increase the proportion of the intellectual property indicators in the scientific and technological progress targets within a responsible evaluation system for Party and government leaders.”</i>
Chongqing	<ul style="list-style-type: none"> • <i>IP Plan issued in 2011:</i> Section 4, Part 1: <i>“...Incorporate such intellectual property rights indicators as patent creation, patent performance into the review and assessment of government-funded projects, and into the identification conditions of professional and technical qualification titles for special talents.”</i> <p>Section 6, Part 3: <i>“Improving the assessment system of intellectual property, incorporate the development of intellectual property into the annual performance evaluation of the leading municipal bodies...”</i></p>
Gansu	<ul style="list-style-type: none"> • <i>IP Plan issued in 2011:</i> Section 5, Part 2, para. 3: <i>“Improving the performance evaluation system for intellectual property of indigenous innovations. Regulating technology innovation activities under the implementation of intellectual property policy, ensuring protection of intellectual property and income distribution through intellectual property industrialisation. Incorporate the output, efficiency, protection of indigenous intellectual property rights into the assessment index system of the province's innovation work, also taking these indicators as the basis of the performance appraisal, job classification and rank promotions for scientific and technical personnel. Perform a sample survey to gauge recognition of IP, guiding education regarding IP elements among citizens, and attempting to establish a comprehensive indicator system to analyse the intellectual property situation.”</i> Section 4, Part 2, para. 2: <i>“Implementing the responsibility system for administrative work of Intellectual Property, incorporate the implementation of Intellectual Property Strategy work into the target responsibility assessment...”</i> <p>Section 5, Part 1, para. 2: <i>“Implementing the responsibility system and accountability system. Governments at all levels should incorporate the IPR creation, management, protection and use into the government target assessment system as an important indicator of the annual work and the year-end performance assessment.”</i></p>

<p>Guangxi</p>	<ul style="list-style-type: none"> • <i>Technology and Science Development Plan issued in 2011:</i> Section 4, Part 3, Para. 1: “Establish and improve the science and technology statistics, monitoring and evaluation system, optimise the assessment of target responsibility system on science and technology progress of municipal and county Party and government leaders.” <p>Section 4, Part 5: “Deepening the pilot demonstration of intellectual property rights, incorporating intellectual property rights indicators into the performance appraisal system of the indigenous innovation of enterprises, universities, research institutes and other innovative subjects.”</p>
<p>Hainan</p>	<ul style="list-style-type: none"> • <i>IP Plan issued in 2011:</i> Section 4, Part 3: “Developing patenting promotion and innovation mechanisms. Speed up the establishment of making enterprises the main body of the patenting mechanism, guide the system and structure of patent management, and promote patent innovation and application of enterprise units. Maintain engineering technical centres, research and development centres, and high and new technology enterprises, and make IPR core patent technology of science and technology project planning and important basis. Reinforce IPR management of science and technology project planning and approval and establish at the provincial and citywide level the IPR management mechanisms of this project planning and approval. Make the obtainment of indigenous IPR the most important prerequisite for the examination and acceptance of project planning for important science and technology project planning and innovation platforms. Gradually establish an IPR examination and expounding system for Hainan’s important science and technology innovation projects. Incorporate indigenous IPR output quantity, quality, implementation benefits, and IPR system construction condition into the project evaluation index system and conduct supervision and management.” <p>Section 4, Part 5: “Further improving the assessment of patent work, consider patent work performance as one of the necessary conditions for performance evaluation of corporate technology centers, high-tech enterprises and hi-tech industrial parks. Incorporate the management performance of patent work, including the amount of R & D investment, the quantity and quality of patents, patent transformation, patent transfer and patent licensing, into the annual performance management assessment indicators for the relevant administrative departments, encouraging innovation.”</p>
<p>Henan</p>	<ul style="list-style-type: none"> • <i>IP Plan issued in 2010:</i> Section 4, Part 5: “Considering the results of the intellectual property assessment as an important part of the target responsibility performance evaluation of the municipal and district Party and government leaders for the scientific and technological progress and talents cultivation.”
<p>Jiangsu</p>	<ul style="list-style-type: none"> • <i>IP Plan issued in 2011:</i> Section 4, Part1, para1: “Improve the intellectual property strategy and implementation of the performance evaluation system, the establishment of a scientific management system of patent examination, and to strengthen the implementation of performance assessment.” <p>Section 4, Part 2, Para 1: “Strengthening catalogued evaluation on invention performances of universities and institutes, and obtaining original patents</p>

	<p><i>should be the key elements of evaluation on basic research and cutting-edge technology research, obtaining invention patent and utility models should be the key elements of evaluation on applied research, developed research...improving patents grants and rewards system, enacting 'Measures on Patent Rewards in Jiangsu Province' to stimulate inventing and improve patent quality."</i></p> <p>Section 4, Part 3, Para 1: <i>"Establishing positive interaction mechanism of patent transfer from institutions of higher-learning, scientific research institutions to enterprises, incorporating patent transfer into the research performance evaluation, promoting patent utilisation and industrialisation."</i></p> <p>Section 5, Part 1: <i>"Establishing a scientific work performance assessment mechanism, taking the scientific patent management as the important indicator to measure the implementation of Scientific Outlook on Development and to measure the regional development capacity. "</i></p>
Liaoning	<ul style="list-style-type: none"> • <i>IP Plan issued in 2011:</i> <p>Section 3, Part 2, para. 2: <i>"...Including intellectual property indicators in the science and technology implementation and evaluation system as well as in the performance evaluation system of SOEs. Encouraging high-education institutions and universities to take into account the quantity, quality and application of intellectual property in the job classification, rank promotion and other performance evaluation index systems of the faculty and research staff; increasing the proportion of intellectual property in the science-technical evaluation system...."</i></p> <p>Section3, Part 2, para. 3: <i>"...Put the year-on –year growth rate of China invention patent applications' into the government performance evaluation system..."</i></p>
Shaanxi	<ul style="list-style-type: none"> • <i>IP Plan is issued in 2011:</i> <p>Section 4, Part 2: <i>"...Establishing a comprehensive evaluation mechanism for intellectual property performance, scientifically assess work performance of all levels of government and enterprises and institutions ..."</i></p> <p>Section 3, Part 7: <i>"...Focus on the establishment of evaluation system of intellectual property rights for large and medium-sized SOEs..."</i></p>
Shandong	<ul style="list-style-type: none"> • <i>IP Plan issued in 2011:</i> <p>Section 3 Part 1 Para 2: <i>"Establishing IPR Strategy Implementation Evaluation Mechanisms. Perfect the evaluation mechanism of provincial, city-wide, and district-wide IPR leadership by holistically bringing into play function evaluation, strengthening inter-department cooperation, actively creating collaboration, clearly dividing labour, and jointly promoting a working atmosphere of IPR implementation strategy. Establish an IPR performance evaluation index system. Include the state of strategy implementation into the annual government performance goals on a departmental, municipal, and district-wide level. Periodically analyse and evaluate the state of IPR strategic implementation.</i></p> <p>Section 3, Part 2, Para. 2: <i>"Incorporating the annual patents granted and the number of invention patents owned per ten thousand people into the government assessment indicators."</i></p> <p>Section 3, Part 6, Para 2: <i>"Actively promote patent professionals into the range of job classification."</i></p>

<p>Sichuan</p>	<ul style="list-style-type: none"> • <i>IP Strategy issued in 2009:</i> <p><i>Section 3, Part 4: “Establishing the target assessment and statistical index system of government intellectual property work, incorporating the number of intellectual property owned and the effectiveness of patent transformation into the economic and social development statistics.”</i></p> <p><i>Section 5, Part 3, Article 1: “Incorporating intellectual property indicators into such evaluation systems as the identification of high-tech enterprises, the evaluation of enterprise technical innovation activities and performance appraisal of SOEs.”</i></p> <p><i>Section 5, Part 5, Article 2: “Give full play to the important role of colleges and universities, research institutes in the creation of the indigenous intellectual property rights. Strengthen scientific and technological work in intellectual property management, own intellectual property as a scientific and technological innovation, an important indicator of the use of intellectual property as important indicators of the evaluation of scientific and technological competitiveness, and promote colleges and universities, research institutes of intellectual property rights are transferred to the enterprise to promote the universities, research institutes, intellectual property rights of indigenous innovation, commercialisation, industrialisation.”</i></p> <p><i>Section 6, Part1: “Incorporating the implementation of intellectual property strategy into the important aspects of government target assessment.”</i></p>
<p>Tianjin</p>	<ul style="list-style-type: none"> • <i>IP Plan issued in 2011:</i> <p><i>Section 4, Part 3, Article 1:” ...Formulating the Tianjin Guideline on the SOEs’ Implementation of Intellectual Property Strategy, further promoting incorporation of intellectual property into the performance evaluation index of SOEs...”</i></p> <p><i>Section 4, Part 5, Article 2:” ...Incorporate the quantitative indicators of intellectual property rights and the economic benefits gained from intellectual property rights utilisation into the performance appraisal, job promotion and reporting incentives for professional and technical personnel.”</i></p> <p><i>Section 4, Part 6: “Strengthening the intellectual property-oriented work in multiple and district level of technology projects, industrialisation projects and all kinds of technological innovation and industrialisation platform, Incorporating the acquisition and implementation of patents into the assessment index of project-application and project-acceptance”</i></p> <p><i>Section 5, Article 3: “Incorporating the work performance of intellectual property into the performance evaluation index system of Party and government leading cadres and the person in charge of SOEs.”</i></p> <p><i>Section 5, Article 4: “Strengthening the significance of intellectual property in the recognition and evaluation process of a municipal enterprise technical centres, engineering technical centres, engineering centres and key laboratories, and incorporate the invention, applications, protection and management of intellectual property into the performance evaluation index system”</i></p>

<p>Zhejiang</p>	<ul style="list-style-type: none"> • <i>IP Plan issued in 2012:</i> <p>Section 5, Article 4: <i>“Establish the evaluation index system, incorporate patent indicators into the evaluation system of economic development and society progress; strengthen the supervision of the local patent work, guidance and assessment. Further establish and improve enterprises, especially patent statistical indicators of patent pilot demonstration enterprises.”</i></p> <p>Section 3, Part 1: <i>“Establish and improve the patent appraisal review mechanism of provincial major economic activities, considering the evaluation of intellectual property rights as the core of the review mechanism...taking the patents owned, especially the invention patents owned indicators as the important consideration of the identification and the evaluation of high-tech enterprises, provincial major innovation platform, industrial technology innovation, strategic alliances and other innovative carrier, also as the important index of the job classification and rank promotion for professional and technical personnel of institutions of higher-learning and research institutes.”</i></p>
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Source: Review of provincial/municipal 12th Five Year IP Plans, recent IP Strategies, and equivalent plans and strategies.
Note: This is a non-exhaustive list of performance evaluation criteria from all of these plans. Also, there may be other articles within the policies cited herein that are not mentioned hereto but also relate in some ways to patent-related performance evaluations. Translations are from the European Chamber thus are unofficial.

Chapter 3

VII.3.1 Example financial incentives for patent development from major recently promulgated sub-central IP plans and strategies

Table 39: Example financial incentives for patent development from major recently promulgated sub-central IP plans and strategies

Province/ Municipality/ Autonomous Region	Financial support for patent development from 12 th Five Year IP Plans, other equivalent plans , Provincial IP Strategies and other equivalent plans
Anhui	<ul style="list-style-type: none"> • <i>IP Plan issued in 2011:</i> Section 4, Part 3, Article 9: <i>“Increasing support for industrialisation of patent technology to establish special funds for patent utilisation and patent industrialisation, set-up the Anhui Patent Award to improve the patent output quality and levels of industrialisation. Establishing a pilot base for patent industrialisation, carrying out the pilot support for patent ventures to promote the entrepreneurship of non-service inventors and SMEs.”</i> <p>Section 5, Para. 2: <i>“Establishing the continuously increasing mechanism of financial supporting intellectual property budget. Strengthening the management of special funds for patent development... Do an excellent job of subsidising foreign patent applications.”</i></p>
Hebei	<ul style="list-style-type: none"> • <i>IP Plan issued in 2011:</i> Section 3, Part 2, Para. 2: <i>“Accelerate the establishment of the government-guided, project-driven patent boosting system. Continue to increase the financial input to enterprises and institutions based on their differences in area, size and development stage...”</i> <p>Section 4, Part 2: <i>“Increase financial investment in the major work of the Hebei 12th Five Year Intellectual Property Plan, and make adjustments according to the annual work priorities. Promote that the government at all levels, industry sectors and enterprises, increase patent funding Inputs and guide commercial financial institutions to support the patent commercialisation and industrialisation, and gradually establish and improve a diversified and multi-channel of IP funding input system which is market-oriented and recognise enterprises as the mainstay.”</i></p>

<p>Jiangsu</p>	<ul style="list-style-type: none"> • <i>IP Plan issued in 2011:</i> <p>Section 2, Part 2: <i>“Promoting the award polices of indigenou invention, establish government procurement of patent products, explore a new incentive and allocation mechanism of patent transformation...”</i></p> <p>Section 4, Part 3, Para. 3: <i>“Exploring the establishment of a patented operating mechanism. Explore the establishment of Patent Bank, research on the establishment of Patent Bank operating and distribution of benefits mechanism. Establish special Patent Bank funds. Actively encourage, guide and support input by private capital and other social resources into Patent Banks.”</i></p> <p>Section 4, Part 2: <i>“Optimising the subsidisation and awarding system of patents. Verify and improve the ‘Jiangsu Management Measures on Provincial Subsidy Funds,’ promulgate the ‘Jiangsu Patent Award Measure’, stimulating inventions and improving patent output quality.”</i></p> <p>Section 5, Part 2: <i>“Increasing the maximum amount of patent rewards, and strengthening the rewards to outstanding patents/inventors and enterprises with standardisation of IP management. After registering the relevant patent technology transaction contracts, the income of patent intermediary service organistions engaged in patent technology development, transfer, licensing and other related consulting services, can be exempted from the business tax and education surcharge. Increase the amount of patent awards, and increase the award efforts of excellent patents, excellent inventors and excellent intellectual property management of standardised enterprises.”</i></p> <p>Section 5, Part 3: <i>“Increasing the financial fund input into patents, establish special funds for patent. Establish the stably increasing mechanism of financially supporting intellectual property budget, realising the financial investment growth rate should be significantly higher than the regular financial revenue growth. Increasing grants for invention patent applications and patents granted, particularly for invention patents granted. Increase the financial investment on the areas including patent services, overseas rights protection, personnel training, industry early warning mechanisms. Promote the existing special funds of science and technology, education, culture, industry, trade and other areas to tilt to the development of patents...”</i></p>
<p>Liaoning</p>	<ul style="list-style-type: none"> • <i>IP Plan issued in 2011:</i> <p>Section 3, Part 2, para. 3: <i>“Improving the reward system for intellectual property. Put ‘the year-on-year growth rate of China invention patent applications’ into the government performance evaluation system. Enforcing a special government incentive system for intellectual property, providing institutions with the Gold Award for China Patents a one-time award of 500,000 RMB and providing the institutions with the China Patent Excellence Award with a one-time award of 200,000 RMB. Formulating municipal and county award measures based on local practice.”</i></p>

<p>Ningxia</p>	<ul style="list-style-type: none"> • <i>IP Strategy issued in 2011:</i> Section 5, Part5, Article 38: “Increase capital investment in intellectual property work. Increase financial investment in intellectual property work, promote various types of intellectual property pilot and demonstration projects, cultivate projects with IPR of advantageous enterprises, an intellectual property-focused county (city, district), engineering, intellectual property, implementation and industrialisation of intellectual property, information construction of intellectual property and so on. Establishing special funds for invention patent application and maintenance to promote the dramatic increase of the number of invention patents owned in Ningxia. Municipalities, counties (districts) can increase the financial input for intellectual property work according to the economic and social development needs and local financial situation to promote regional intellectual property. Establishing an intellectual property award mechanism to reward patent technologies, patent products and patent inventors. Award the institutions who win the Gold Award for China Patents, China Patent Excellence Awards and any other national intellectual property awards. Set up the distribution of benefits and reward system of intellectual property rights in enterprises and institutions. Award the inventors, designers, and promotion and service staff who make contribution in the process of intellectual property creation, utilisation and promotion.”
<p>Shandong</p>	<ul style="list-style-type: none"> • <i>IP Plan issued in 2011:</i> Section 3, Part 7, Para. 2: “Increase financial input. Actively see that all levels of government further increase the input of patent work, and universally establish special funds for patent development in governments at or above the county level. Establish a patent reward system, providing recognition awards to excellent indigenous innovation projects with significant economic and social benefits, as well as to the institutions and individuals who make outstanding contributions to the creation and utilisation of patents...”
<p>Shanghai</p>	<ul style="list-style-type: none"> • <i>IP Plan issued in 2011:</i> Section3, Part1, Article 1: “Improve the ‘Shanghai Patent Subsidy Measures’ and formulate the ‘Shanghai Reward Measures for Invention Patents’ to further optimise the patent application structure and to reward significant inventions...”
<p>Sichuan</p>	<ul style="list-style-type: none"> • <i>IP Strategy issued in 2009:</i> Section 5, Part 3, Article 1: “...Increase financial support and reward efforts for invention patents Improve the bonus and payment system of service invention-creations”. Section 5, Part 3, Article 2: “Encourage the use and industrialisation of intellectual property rights. Strengthen the guiding role of government funds for the commercialisation and industrialisation of intellectual property, and continuously improve the quantity and use efficiency of special funds for patent. Use fiscal, financial, investment, and government procurement policies and industry, energy, environmental protection policies to guide the patent utilisation of enterprises and institutions. Establish a government procurement mechanism and prior purchase polices for important equipment and products with indigenous intellectual property rights belonging to enterprises and institutions. Encourage financial institutions and venture capitalists to increase funds for the commercial utilisation of intellectual property.”
<p>Tianjin</p>	<ul style="list-style-type: none"> • <i>IP Plan issued in 2011:</i>

Section 4, Part 6, Article 1: *“Improving patent quantity and quality ... enacting the “Tianjin Implementation Measures on the Ownership and the Bonus and Payment System of Service Invention-Creations.” Implement the “One award, Two rewards” system and other relevant regulations. Encourage annual growth rates of enterprise patent applications up to 20%.”*

Section 5, Part2: *“Increasing municipal financial funds on intellectual property, establishing special funds for intellectual property at the district and county level. ...Greatly developing IPR pledge financing, IPR insurance and other financial innovations to shape a multi-channel IP funding input system. A certain proportion of the financial fund input of key scientific research projects and major technological transformation projects should be put into the management of intellectual property rights...”*

Section 5, Article 3: *“Greatly publicise and recognise the institutions and individuals who contribute outstandingly to the field of intellectual property, strengthening the influence of awards such as the “Tianjin Patent Award,” “Worker Inventor Award,” “Women Inventor Award,” and “Juvenile Inventor Award.” Setting forth a wide distribution of awards including taking shares in the form of intellectual property rights; accelerating the forming of a new distribution system which will stimulate inventions and the implementation of patent transformation.”*

Section 5, Article 4: *“...Strengthen the significance of intellectual property in science and technology awards ...Special funds such as the key technology invention project fund, science and technology invention fund, technology invention fund for technological SMEs, and government financial funds should tilt towards enterprises with indigenous intellectual property rights.”*

Source: Review of provincial/municipal 12th Five Year IP Plans, recent IP Strategies, and equivalent plans and strategies. Note: This is only intended as a sample, i.e. it is a non-exhaustive list of financial incentives from all of these plans. Also, there may be other articles within the policies cited herein that are not mentioned hereto but also relate in some ways to patent-related financial incentives. Translations are from the European Chamber thus are unofficial.

Some other issues

Some other (non-exhaustive list of) issues and recommendations flagged for inclusion but ultimately not included in the body of the report

Explanatory note: While numerous issues were vetted for further analysis in this study and ultimately not included, the following issues were even more seriously considered for potential inclusion in the body of this paper although were also ultimately not included. (Reasons for not including such issues include that perhaps while problematic in their own right, they either do not appear to notably drag down patent quality in China; and/or there is not sufficient evidence for these practices to warrant them being highlighted in the body of the paper; and/or they are notably diverging views on if the issue mentioned is a problem and/or how it should be addressed.)

Judges are relegated to judicial review after Patent Re-examination Board rulings on invention patents

Issue: Even if an invention patent of questionable validity is found in an infringement case in China, the infringer needs to file an application with the PRB for invalidating the patent, and only then can the judge determine the merits of an invalidation decision. Further, most of time the court will not even determine the validity of the patent, but instead focus on the legitimacy and rationality of the PRB's decision. This said, if the court finds the decision was made improperly, the invalidation decision can be revoked.⁴²¹

At present, the structure of this system in many ways makes sense for China, as judges are not typically trained to determine the technical merits of an invention patent's validity, and thus should rely on those at the PRB that are technically trained to do so; however, this is not to say that there are still concerns with this system and that it might be improved. For example, some concern may be warranted over the incentives PRB reviewers have/do not have to invalidate a patent that one of their potential colleagues (other SIPO examiners) formerly approved. Further, it should be noted that the aforementioned restraints on the judiciary in patent infringement cases in China contrasts with the well-functioning and arguably more efficient procedure in a number of countries where judges can determine patent validity without such prior decision from a re-examination board. However, unlike in China, in some of these countries, like Germany for example, the judges hearing patent cases are not only lawyers and professional judges, but a large proportion are also technically trained to review patents; this provides them not only the authority but technical capacity to review and authoritatively rule on such cases.⁴²²

Recommendation: China might create a bifurcated system where the PRB is an important first instance reviewer of patent validity in patent infringement cases, but a separate patent tribunal, presided over exclusively by technically/scientifically qualified judges to determine patent validity, might also be established to rule on cases in the second instance. Rules could be issued stipulating that in an instance where the PRB and patent tribunal make opposite decisions, the tribunal's decision is followed.

Standard of “inventiveness” for utility models*

Issue: Given the proliferation of low quality utility models, it is worth questioning if the statutory requirements for Chinese utility models in particular need improving to boost patent quality in China. Utility models in China are only required to meet a much lower threshold of “inventiveness,” also called “inventive step,” as compared to invention patents. This criterion for patentability in particular does not appropriately discourage proliferation of low quality patents in China.⁴²³

Recommendation: The State Council and SIPO should revise the standard of inventiveness employed to evaluate utility model patents to be in-line with the German approach that there is no difference for inventive step for invention patents and inventiveness for utility models.⁴²⁴

**Note: This recommendation was not included in the body of the study as it is the opinion of the author that this is not necessary per se at the present stage of China’s development; however, this indeed may be prudent to consider at some time in the next decade or so.*

Standard of “inventiveness” for invention patents

Issue: Gao et al. (2011) suggests that the concept of inventiveness for invention patents grounded in the *Patent Law* and detailed in the *Guidelines for Patent Examination* is overly ambiguous. As such, the study suggests that when simple technical solutions that can be relatively easily imitated are challenged as infringing they are often easily invalidated because they are simple and, in absence of a clearer definition, are quickly considered not to satisfy the criteria for inventiveness. (Note that instead of argue the point, when a patentee is charged with infringement they often resort to the defense of invalidity). This is argued to be an uncertainty in the review process of patent applications and adjudication in patent disputes.

Recommendation: As recommended in Gao et al. (2011), the *Guidelines for Patent Examination* should be revised so as to provide a specific and objective criteria for defining “inventiveness” that will allow for protection of simple technical solutions that should be protected under the *Patent Law*. This standard might be shifted from the threshold premised on a neutral person skilled in the art who does not possess “recognised skill” to a person skilled in the art who does possess recognised skill.⁴²⁵

Inventor clawback

Issue: Other countries do not have rigid rules on inventor “clawback” like China. Like non-compete agreements, this rule reduces labor mobility although also reduces IPR misappropriation. The basis for such rules is listed in the following:

Article 11 of the *Implementation Regulations of PRC Patent Law (“Implementing Regulations”)* sets forth the invention clawback regulation in the PRC.

Under Article 6 of *PRC Patent Law*, if an invention is made by a person in execution of the tasks of the entity to which he belongs, or made by him mainly by using the material and technical means of the entity, then the invention is a service invention and its ownership should belong to the entity.

Article 11 of the *Implementing Regulations* further details the circumstances prescribed in Article 6. As to “made by a person in execution of the tasks of the entity to which he belongs,” Article 11 specifically prescribes that such an invention also refers to those which are made “within one year

from his resignation, retirement or change of work, where the invention-creation relates to his own duty or the other task entrusted to him by the entity to which he previously belonged.”⁴²⁶

Recommendation: Amend these rules to be more in-line with international practice.

Overly strict application of the “doctrine of equivalents” in patent litigation

Issue: Some sources suggest that Chinese courts may apply the “doctrine of equivalents,” the technical scope of what a patent covers, overly strictly in some cases. This is particularly problematic in infringement cases centering on patent validity, whereas courts may overly narrowly rule a patent covers a particularly technical field, and an even closely-related patent is found as not infringing as it exists ‘outside’ that particular field.⁴²⁷

Recommendation: Create a joint taskforce of SPC judges and other experts, along with equivalent representatives from the EU, to assess trends in Chinese courts’ application of the “doctrine of equivalents.” Provide recommendations therein to ensure better application of this principle.

Concerns with SAC’s Patent Policy Proposal and CNIS’ Patent Disposal Rules

Issue: A variety of concerns surround two particular rules governing essential patents in China: the *Disposal Rules for Inclusion of Patents in National Standards (“Patent Disposal Rules”)*, issued for comment on January 21st 2010 by the China National Institute of Standardisation (CNIS)⁴²⁸ (and still undergoing review) and a measure to which it closely relates, the *Proposed Regulations for the Administration of the Formulation and Revision of the Patent-Involving National Standards (“SAC Patent Policy Proposal”)*, issued by the Standards Administration of China (SAC), on November 2nd 2009.⁴²⁹ As identified by Willingmyre (2009), a range of problems with the wording of the *SAC Patent Policy Proposal*, particularly regarding treatment of compulsory licensing in Articles 12, 13 and 15 and Article 9, potentially drag down patent owners’ ability to monetise and receive a reasonable ROI.⁴³⁰ As identified by Willingmyre (2010), while there are some positive provisions in the *Patent Disposal Rules*, there are still some uncertainties, including the lack of distinction between “essential patents” and “essential patent claims,” lack of clarity that a declaration form is not a license, and lack of clarity on certain disclosure obligations.⁴³¹ Collectively, these shortcomings promote inferior technologies and/or unnecessarily costly implementation for important standards, and may discourage the usage of innovative technologies and related quality patents in international standards.

Recommendation: As suggested in Willingmyre (2010), revise the *SAC Patent Policy Proposal*, particularly regarding treatment of compulsory licensing in Articles 12, 13 and 15 and Article 9. Specifically, clarify uncertainties over the lack of distinction between “essential patents” and “essential patent claims,” lack of clarity that a declaration form is not a license, and lack of clarity on certain disclosure obligations.

R&D Centre requirements

Issue: The Chinese government employs a wide-range of incentives, for example tax incentives, to spur innovation through R&D centres which are directly and indirectly intended to encourage patents. These include the ability to be recognised as a qualified R&D Centre if meeting certain legal entity, capital and other (in certain situations employment threshold) requirements. If meeting these

criteria, enterprises can qualify for exemption of customs duties and import VAT exemptions on imported equipment, and a Value-added Tax (VAT) refund for certain domestically-purchased equipment. Also, they can receive an EIT exemption on income up to RMB 5 million of transferred income on “self-developed” technology and related services, and a 50% reduction of tax on this type of income above the aforementioned threshold.⁴³² A range of other tax incentives may be available.

There are some concerns among foreign business about the “overly strict” legal entity and capital requirements for becoming an “R&D Centre,”⁴³³ in China which may in-turn, albeit indirectly, harm innovation and patent quality development in China. Specifically, these requirements may in effect limit the ability of operations of foreign enterprises to produce quality patents given they are denied access to collaborative networks and financial incentives even though they are just as capable as other legally represented entities in innovating and producing quality patents.

Recommendation: Revise the overly strict legal entity and capital requirements for becoming an official R&D Centre to better allow otherwise qualified affiliates to establish an R&D Centre in China.