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# **The new kid in the forest: the impact of China's resource demand on Gabon's tropical timber value chain**

Terheggen, Anne

Development Policy and Practice Group, The Open University

September 2010

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**THE NEW KID IN THE FOREST:  
THE IMPACT OF CHINA'S RESOURCE DEMAND ON  
GABON'S TROPICAL TIMBER VALUE CHAIN**

**Thesis submitted for the degree of Doctor of Philosophy**

**International Development**

**Development Policy and Practice, The Open University**

**Anne Terheggen (Doctorandus en Economie)**

**September 2010**



## **ABSTRACT**

This dissertation is anchored in the disruptive impact of China's resource-based economic expansion over the last two decades. Whilst the country's economic growth follows traditional patterns of development, the size of China's population challenges the small-country assumption inherent in many macroeconomic trade models. The recent commodity boom and the seeming reversal of commodity exporting countries' terms of trade are a result of China's non-marginal impact of consumption. This thesis uses examples from the tropical timber industry in general and primary data from Gabon in particular to examine the impact of Chinese consumption of tropical timber forest products on a producer industry in the South. The global value chain framework is used as a method to study the likely changes in the organisation of production and trade.

The research examines the possible re-direction of tropical timber trade flows away from the OECD towards China. It can be expected that the access to the Chinese market is defined over different standards, as buying decisions in traditional consumer countries vary from Chinese ones based on their stages of industrialisation and per capita incomes. The analysis also investigates whether the shift in markets leads to changes in the division of labour, the income distribution and the usage of domestic factors of production in Gabon. Additionally, the growing presence of Chinese producers in Southern resource industries has the potential to accentuate structural changes in the organisation of production, because Chinese actors' activities are said to be concentrated in the extractive rather than the processing stages of production, often in disregard of socio-environmental consequences.

Research results obtained in this dissertation, with respect to possible changes in the organisation of production and trade, plus knowledge about the impact of China's significant consumption of natural resources on global commodity prices and the terms of trade movement, enable us to draw conclusions with respect to theoretical discussions about the role of natural resources in economic development, the implications for industrial and economic policy formulation, and the global value chain framework as a research method.



## **ACKNOWLEDGEMENTS**

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## LIST OF ABBREVIATIONS

ARC	average rate of conversion
CFAD	Concession Forestière sous Aménagement Durable (Forest Concession under Sustainable Management)
CPAET	Conventions Provisoires d'Aménagement-Exploitation-Transformation (Preliminary Agreement of Management Planning-Exploitation-Processing)
CUM	cubic metre (m <sup>3</sup> )
EFI	European Forest Institute
EIA	Environmental Investigation Agency
EU	European Union
EUR	Euro (€)
EWP	engineered wood product
FAO	Food and Agriculture Organization of the United Nations
FDI	foreign direct investment
FLEGT	Forest Law Enforcement, Governance and Trade
FMP	forest management plan
FSC	Forest Stewardship Council
GATT	General Agreement on Tariffs and Trade
GDP	gross domestic product
GPP	green public purchasing
GSP	Generalized System of Preferences
GVC	global value chain
IMF	International Monetary Fund
ITTO	International Tropical Timber Organization
LDC	less developed country
MEA	multilateral environmental agreement
MEFEPA	Ministère de l'Economie Forestière, des Eaux, de la Pêche et de l'Aquaculture (Ministry of Forestry Economy, Waters, Fisheries and Aquaculture)
MFN	most favoured nation
NGO	non-governmental organisation
NIC	newly industrialised country
NTB	non-tariff barrier to trade
OECD	Organisation for Economic Co-operation and Development
PEFC	Programme for the Endorsement of Forest Certification
PFA	Permis Forestier Associé (Forestry Association Permit)
PGG	Permis de Gré en Gré (Permit upon Agreement)
PPWP	primary processed wood product

RWE	roundwood equivalent
SEPBG	Société d'Exploitation des Parcs à Bois du Gabon (Gabon Wood Stocks Exploitation Company)
SFM	sustainable forest management
SNBG	Société Nationale des Bois du Gabon (National Wood Society of Gabon)
SPWP	secondary processed wood product
SSA	Sub-Saharan Africa
UNCTAD	United Nations Conference on Trade and Development
UNECA	United Nations Economic Commission for Africa
UNECE	United Nations Economic Commission for Europe
USA	United States of America
USD	United States dollar (US\$)
WRI	World Resources International
WTO	World Trade Organization
WWF	World Wide Fund for Nature
XAF	Central African franc (FCFA)

## CHAPTER 1 INTRODUCTION

When I started my postgraduate studies at the Open University, the centre of my world was the aquaculture industry in Aceh, Indonesia. Marked by the constraints and effects of almost three decades of violent conflict and swept away by one of the most devastating tsunamis of South-East Asia in December 2004, the emergency programmes and following reconstruction work was a battle fought on several fronts. Given the scale of the physical destructions but more importantly human suffering made it not only necessary but also inevitable that my colleagues and I devoted all of our energy to the project assigned to us. As months passed, aid in various forms and shapes was poured into the region and our work progressed as measured by every aid organisations' compulsory project goals. Still, something not captured by such goals was the unique insight we gained of peoples' lives, their backgrounds, and their at times dire situations.

Thinking back, it still astonishes me today how isolated some of the local communities are from the rest of Indonesia, let alone the world. In aquaculture, farming inputs were largely imported and the mature shrimp stock exported. However, none of the farmers ever visited a larvae hatchery outside of the regions' borders, nor had they a clear idea of who is consuming the regions' shrimps. My astonishment was even greater when I learned that industry consultants had already drafted a programme to revive the aquaculture sector based on the global value chain framework, and when I then found out that the programme was inapplicable. The global value chain looked more like an attempt to map a domestic supply chain, the aspect of chain governance was altogether ignored, and proposed actions were clearly driven by the need to meet foreign production and processing standards, which were beyond even the wildest dreams of a local farmer. It turned out that all primary product programmes were habitually designed with European markets in mind, although the largest export volumes of shrimps were in fact destined for China.

Absorbed in my work at that time I did not give much thought to the fact that the largest importer was the Chinese market. Yet, it was clear that exporting to China would mean that the farmers, with only basic education levels, did not need to bother with a whole catalogue of EU import regulations. After I made that mental note, we returned to the immediate problem-solving work of reconstructing fishponds to allow for subsistence food production. The follow-up programme was designed to support farmers to



increase their current and pre-tsunami production quantities. Yet, contrary to the consultants' reasoning that, for example, the use of antibiotics in the production process needs to be ceased to ensure the products' access to EU markets, reality dictated that the usage of antibiotics simply could not be afforded by local farmers. The project was terminated before foreign market requirements could be studied in detail, leaving me to wonder who and on what conditions now buys Aceh's shrimps, as well as how local farmers cope.

Only upon my return to Europe and over the course of my PhD study did I connect the dots between my work experience in Aceh and this dissertation's research agenda. A significant shift in final consumer markets towards China, which is at a different economic stage of development and whose per capita income (distribution) is not comparable to those in traditional commodity importer countries in the North. This thesis studies the possible direct and indirect effects of a shift in final markets on Southern commodity producer countries. It is asserted that conventional frameworks of analysis apply assumptions, such as that commodity exports are directed towards OECD consumers and that commodity markets are characterised by falling international prices, which are challenged by the major impact of consumption of the new emerging economies, specifically China.

## **CHAPTER OUTLINE**

The opening paragraphs mentioned China as a 'new' market for Acehnese shrimps, which appears to be different from more traditional markets for agricultural produce based on its market entry requirements. The following section introduces the Chinese economy by briefly tracing its economic expansion over the last two decades. It is also argued in the first section that China's growth trajectory, although following normal patterns of development, is a disruption to global commodity prices, resource-exporting countries' terms of trade and traditional resource flows. The section ends with a short overview of China's engagement with Africa. The discussion provides the research context of this thesis, which is summarised in the second section. Subsequent sections specify the research questions and the case study used for the thesis' analysis. The chapter ends with the dissertation outline.

### **1.1 INDUSTRIALISATION AND CHINA'S DISRUPTIVE IMPACT**

In 2004, Stiglitz commented on the failure of the Washington Consensus: "there is no consensus

[about what strategies are most likely to promote the development of the poorest countries in the world] except that the Washington consensus did not provide the answer” (p. 1). The dominant economic development framework of the 1990s, in essence prescribing to “stabilize, privatize, and liberalize” (Rodrik, 2006, p. 1), is now renounced as a potential panacea for development. Yet, an agreement exists that fundamentally the road to economic growth is in manufacturing subsequently complemented by services (Kuznet, 1966; Syrquin & Chenery, 1989). In more detail, manufacturing is more “catalytic” than low-productivity primary industries, because of its impact on, amongst others, technological progress, innovation, diffusion of knowledge, skills and dynamic comparative advantage (Farfan, 2005; Szirmai & Verspagen, 2010).

Embarking on the process of industrialisation (thus the shift from primary sectors to industrial sectors<sup>1</sup>) resulted in an increasing participation of low-income countries in manufacturing activities. For instance, whereas in 1980 around 75% of developing countries exported mainly commodities, in 2000 around 80% were classified as exporters of manufacturers (Collier, 2002; Dollar, 2001). However, a number of countries (especially in Africa) continue to export primarily commodities (Farfan, 2005; Wood, 2001). Birdsall and Hamoudi (2002) found that these countries grew slower in the 1980s and 90s, and many even experienced declining per capita incomes, than manufacturing-focused developing countries in the same period<sup>2</sup>. UNCTAD (2003, p. 2) summarises, “Price volatility, arising mainly from supply shocks and the secular decline in real commodity prices, and the attendant terms-of-trade losses have exacted heavy costs in terms of income, indebtedness, investment, poverty and development”.

As reflected in the statement above, the concerns about commodity dependency not only rest on the notion of low-productivity, decreasing returns and lack of stimulating impacts associated mainly with agricultural/primary sectors (relative to manufacturing), but also in the movement of real and relative prices of commodities. With respect to the latter, Prebisch (1950) and Singer (1950) pioneered research on developing countries’ terms of trade movements, approximated by the relative price differences between imported manufactured goods and exported commodities. They showed that the terms of trade of developing countries are declining due to greater income and price elasticities for

---

<sup>1</sup> The process of industrialisation is achieved by the accumulation of physical and human capital as well as technological change (discussed in full in Chapter 2).

<sup>2</sup> The same statement was made in a paper by Easterly and Levine (1997) for the period 1965 to 1990. They further concluded that these developments are a result of weak policies, poor education, political instability, inadequate infrastructure and commodity dependence.

manufactured goods relative to primary products (Chapter 2). This finding substantiated the growing creed in manufacturing industries as engines of growth.

Consecutive studies further highlighted a high degree of commodity price volatility bearing substantial risks and consequences for resource exporters' real incomes, fiscal position and macroeconomic stability (Cashin & McDermott, 2002). Furthermore, with a progression of de-industrialisation in advanced economies, i.e. an increasing contribution of services to economic growth, the demand for natural resources is residing (see Chapter 2; Rowthorn & Ramaswamy, 1999). As Lewis asserts in reference to commodity exporters: "For the past hundred years the rate of growth of output in the developing world has depended on the rate of growth of output in the developed world" (1980, p. 555). In sum, the unpredictable price movement and falling relative prices of commodities, as well as declining resource needs in the North emphasise a manufacturing-led development strategy for Southern countries, and thus the necessity to create comparative advantage in factors of production other than natural resources.

### **1.1.1 CHINA'S ECONOMIC GROWTH 'MIRACLE'**

One of the contributing factors to the demise of the economic tools propagated under the Washington Consensus mentioned earlier was the strong growth and industrialisation process of many East Asian economies since the 1970s (Park, 2002; Stiglitz, 1998; Yusuf, 2001). These economies did not follow the Washington Consensus closely, especially regarding the active role of governments in industrial policy design and resource allocation, but nevertheless recorded annual GDP growth rates far exceeding other developing regions and the OECD<sup>3</sup>. The newly industrialised countries (NICs) have set positive examples for other developing countries that manufacturing-based growth through factor accumulation can work in general and outward-orientated industrialisation (based on initial comparative advantage in labour-intensive production) in particular.

China has replicated the success of the NICs: economic growth enabled by significant political reforms, FDI inflows<sup>4</sup> and an outward-oriented trade strategy of manufacturing industries (e.g. Lin & Wang,

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<sup>3</sup> Singapore and Korea grew on average by eight percent and Hong Kong by seven percent per annum during 1973 and 1996, compared to a Sub-Saharan African (SSA) average of two percent and three percent annual GDP growth in the OECD economies in aggregate (Data extracted from World Development Indicators by the World Bank (<http://databank.worldbank.org>) accessed August 2010).

<sup>4</sup> In 2003, China was the largest receiver of foreign direct investments (FDI) inflows globally, receiving a third of all investments amongst emerging economies and around 60% of all Asian-directed FDI inflows (Zhu, 2010).

2008; Zhu, 2010). China experienced average GDP growth rates of around ten percent over the last three decades<sup>5</sup>. In comparison, the growth rate was around two and a half percent in the OECD over the same period. China is now the second largest economy in the world measured in current GDP and instances of poverty have been substantially reduced. For example, the share of the urban poor fell from 99.3% in 1985 to 77.3% in 2005 (Farrell et al., 2006). Nevertheless, China ranks relatively low qua GDP per capita and income inequality remains an issue of concern. It is estimated that per capita income might level that of the USA in between 20 to 50 years (Holz, 2008).

The Chinese economy is now the second largest exporter world wide, expanding its share of world exports of less than one percent in 1978 to nearly nine percent in 2007 (11.3% if Hong Kong is included). In the same year, Germany's share of world exports was 9.5% and that of the USA 8.4% (Zhu, 2010). According to data in Prasad et al. (2004), China's exports and imports have grown on average by 15% annually since 1979, compared to a world increase of seven percent per year. Over the last decades, China has penetrated Northern markets (with its exports) and simultaneously increased its imports, particularly from neighbouring Asia. China is the third largest importer of exports from the South after the USA and Germany (ibid; see also Section 1.1.2).

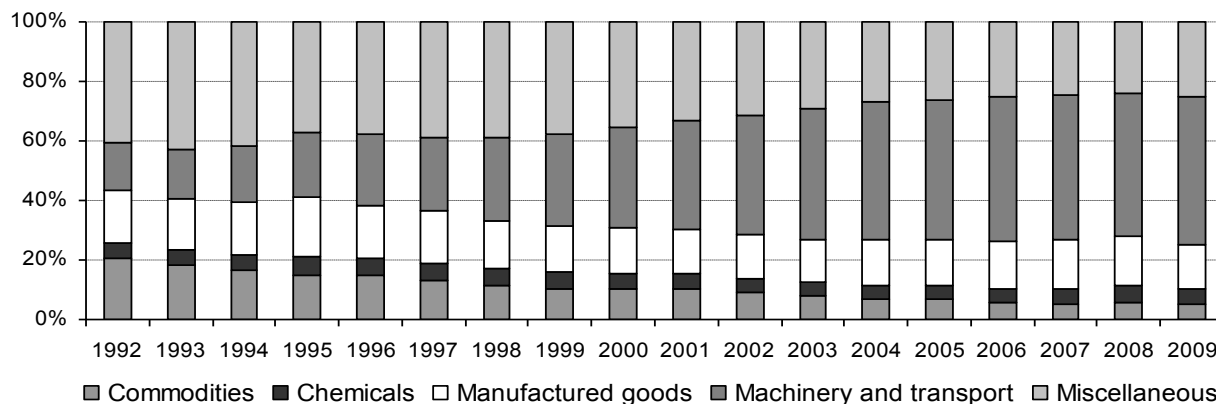
Not only the trade volume but also China's trade structure changed with time (Figure 1-1). China's exports in the past were predominantly comprised of raw materials. Between 1986 and 1995, the share of labour-intensive products, such as textile and clothing, was consistently larger than resource commodities' export share. Since 1995, non-traditional labour-intensive products' shares in exports dominate (Lin & Wang, 2008). Recently, more sophisticated products like electronics and industrial supplies were added to the export portfolio (Prasad et al., 2004). Chinese merchandise trade as a percentage of GDP increased from 20% in 1980 to over 60% in 2007<sup>6</sup>. Overall, China's trade patterns symbolise a high integration into global systems of production, with Chinese industries taking advantage of the fragmentation of production processes, specifically as a location for final processing and assembly of intermediate goods from Asia destined for the North (Kang & Lee, 2007; Prasad et al., 2004; Zhu, 2010).

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<sup>5</sup> All data in this paragraph extracted from World Development Indicators by the World Bank (<http://databank.worldbank.org>) accessed August 2010, unless otherwise specified.

<sup>6</sup> ibid

**Figure 1-1** China's commodity-manufacturers export distribution (percent)



*Source:* Data extracted from United Nations Commodity Trade Statistics Database by the United Nations Statistics Division (<http://comtrade.un.org>) accessed August 2010

*Notes:* Commodities = SITC categories 0-4; Manufacturers = SICT 5-8 (6 excludes 611, 667, 68); Classification system based on Birdsall and Hamoudi (2002, p. 9)

China's achievements in terms of its rapid economic growth and trade are a result of structural changes through factor accumulation following a normal pattern of development. For example, Lin and Wang (2008) argue that China's path of industrialisation is based on a comparative advantage-following strategy, first utilising domestic natural resources, then labour and now the concurrent building-up of capital-intensive industries. Holz's (2008) research shows that the structural change taking place in China, with labour shifting from low-productivity agricultural activities to higher-productivity industry and services, follows that of other countries, like Japan, Korea and Taiwan, at their early stages of economic development. China's rate of growth of exports is analogous to those of Japan and the NICs, though China's increasing share in world exports is in fact slower than the former (Prasad et al., 2004).

Whereas China's economic expansion is hence equal to those of other countries at similar stages of economic development, China has an unprecedented impact on the rest of the world both due to its size and development potential as "China faces another 30 years of continued growth" (Holz, 2008, p. 1683). China's population is at an estimated 1.3 billion or around 20% of the world population compared to a five percent share of the US population and less than that for Japan<sup>7</sup>. By virtue of its size, China has a non-marginal impact on international markets and prices, thus requiring a suspension of the small-country assumption of trade (Kaplinsky, 2009; Prasad et al., 2004). As will be discussed below, "A recognition of China's profound and widespread impact on the world economy

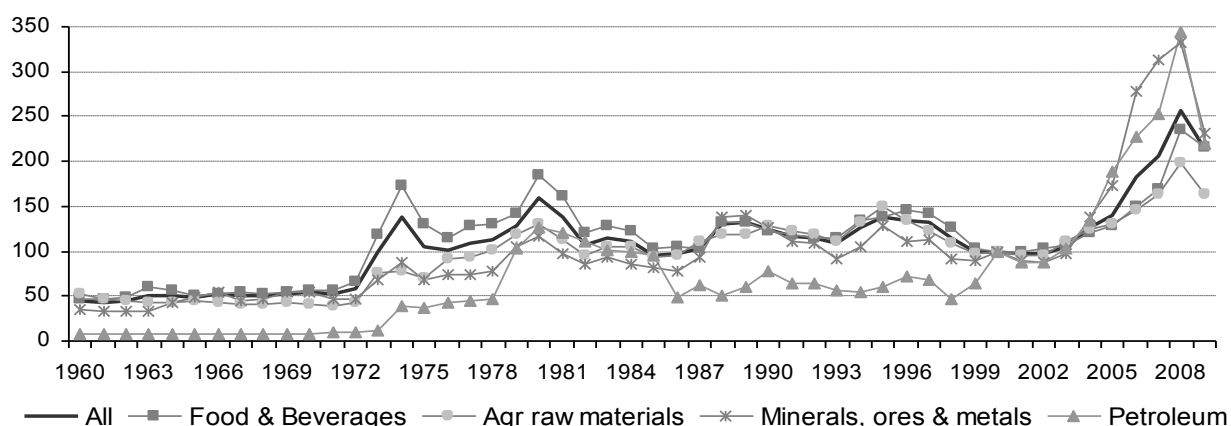
<sup>7</sup> World Population Prospect by the Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat (<http://esa.un.org/unpp>) accessed May 2010.

explains various current economic puzzles” (as cited in Zhu, 2010, p. 1), particularly a shift in trade flows, commodity markets and structural changes worldwide.

### 1.1.2 CHINA’S IMPACT ON COMMODITY PRICES AND TERMS OF TRADE

Over the period 2001 until 2008, commodity prices increased sharply and over a longer period than in any previous price boom (1950-53 and 1972-75). This holds true across all groups of commodities, thus including food and beverages, agricultural raw materials, minerals and metals, as well as crude petrol prices (Figure 1-2). The aggregate commodity price index, which fluctuated around the 110 index point mark during the 1970s until late 1990s, increased from 96 points in 2001 to more than 250 in 2008. The rise in commodity prices was particularly pronounced for metals and oil, with both indices almost quadruplicating between 2001 and 2008. The percentage increase in the indices of agricultural raw materials as well as food and beverages were 110% and 140% respectively.

**Figure 1-2** Commodity price indices (2000 = 100)



*Source:* Data extracted from Commodity Price Statistics by United Nations Conference on Trade and Development ([www.unctad.org](http://www.unctad.org)) accessed May 2010

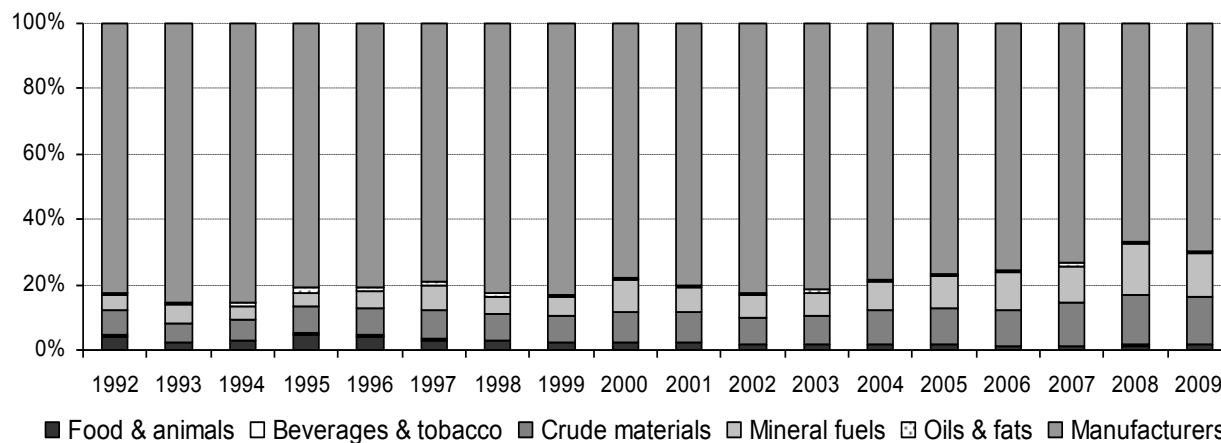
*Note:* Annual averages of free-market price indices (1960 – 2009)

The recent commodity boom unfolded because of an unanticipated surge in demand met by low inventories of supply. More specifically, the rise in prices across all groups of commodities can largely be ascribed to the economic expansion and corresponding resource demands of the emerging economies, in particular China (Farooki, 2010; Goldstein et al., 2006; Hache, 2008; IMF, 2006). For instance, the IMF (2008, p. 7) notes, "Overall, the current boom seems largely associated with increased demand for commodities on the part of China ..., which is outpacing the increase in supply...". This is due both to China’s size (and thus its weight in the world economy) and because, “the two Asian giants China and India are presently passing through a development stage that is much more

intensive in primary materials use than the dematerializing mature OECD economies” (Radetzki, 2006, p. 61).

Agricultural advances, the upgrading of commodity-based manufacturing processing industries and physical infrastructure, as well as improving living standards are reflected in China’s import distribution (Figure 1-3) and global trade data. Whereas China's imports of manufactured products increased by roughly 1,000% between 1992 and 2009 the increase in natural resources was even higher, particularly for crude metals (2,300%), mineral fuels (3,400%) and oils and fats (1,400%)<sup>8</sup>. In 2008, China was the largest importer worldwide of metal ores (32%), oil seeds (38%), tropical timber (34%) and textile fibres (21%). China imported the third largest global volume of non-ferrous metal imports (10%). Overall, China is responsible for much of the world’s resource demand growth (e.g. Radetzki, 2006; Trinh et al., 2006) and China’s resource consumption has “brought about a significant redirection of ... [developing countries’ commodity] exports ... away from OECD markets” (Goldstein et al., 2004, p. 45).

**Figure 1-3** China’s commodity-manufacturers import distribution (percent)



*Source:* Data extracted from United Nations Commodity Trade Statistics Database by the United Nations Statistics Division (<http://comtrade.un.org>) accessed August 2010  
*Notes:* Commodities = SITC categories 0-4; Manufacturers = SICT 5-8 (6 excludes 611, 667, 68); Classification system based on Birdsall and Hamoudi (2002, p. 9)

As a direct consequence of this exceptionally high demand for natural resources in the past 30 years, some authors see the possibility of a fundamental change in the long-run price trend and a period of sustained high price levels compared to previous cyclical boom-bust, low price movements (Barclays Capital, 2006; Zafar, 2007). Contrastingly, other authors classify the current boom as a commodity price super cycle. This implies that prices will eventually fall, although it is not known when and to what

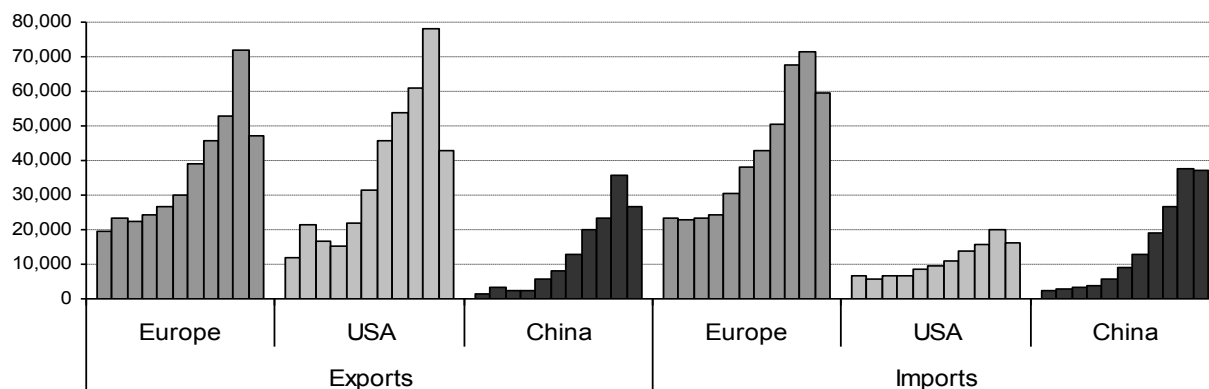
<sup>8</sup> Data extracted from United Nations Commodity Trade Statistics Database by the United Nations Statistics Division (<http://comtrade.un.org>) accessed August 2010

level vis-à-vis the pre-boom period (Cuddington & Jerrett, 2008; Heap, 2005; Farooki, 2010). Moreover, the terms of trade of exporters of commodities have generally increased due to the Chinese-induced change in commodity price. As Goldstein et al. (2004, p. 40) observe, “In general, both net barter and income terms of trade have improved substantially since 2000”. Kaplinsky (2006a, b) further asserts that the current developments mark a historic disruption to Southern resource exporters’ terms of trade<sup>9</sup>.

### 1.1.3 CHINA’S ENGAGEMENT WITH AFRICA

The need for increasing amounts of resources to fuel its industrial expansion has propelled China to being one of the top commodity importers globally. In many instances, these natural resources, particularly oil, metals, tropical timber, diamonds and cotton (Besada et al., 2008) originate from well-endowed African countries. To be more precise, both exports to and imports from China increased more rapidly over the past ten years compared to Sub-Saharan Africa’s trade with its traditional partners (Figure 1-4). China is now the third largest export market for Africa after Europe and the USA, and the second strongest origin of imports of mostly light-manufacturers (after Europe)<sup>10</sup>.

**Figure 1-4** Sub-Saharan African trade with Europe, the USA and China (1999-2009, USD million)



Source: Data extracted from Direction of Trade Statistics by the International Monetary Fund ([www2.imfstatistics.org/DOT](http://www2.imfstatistics.org/DOT)) accessed August 2010

Indeed, the abundance of natural resources is one of the key explanatory variables behind China’s engagement with strategic partners in Africa. In the words of Bosshard (2008, p. 1), “China – ‘the world’s factory’ – is trying to secure access to resources in Africa that it lacks at home”. Yet, apart from

<sup>9</sup> Note that the overall terms of trade trend is equally a result of prices of manufactured goods, which generally increased but where prices of manufacturers are declining more the greater China’s participation in the respective production group (Kaplinsky & Santos-Paulino, 2006).

<sup>10</sup> The percentage distribution between Europe, the USA and China regarding SSA’s exports are 26.4%, 20.2% and 12.6% and regarding SSA’s imports 29%, 6.3% and 14.5% respectively (Data extracted from Direction of Trade Statistics by the International Monetary Fund ([www2.imfstatistics.org/DOT](http://www2.imfstatistics.org/DOT)) accessed August 2010).



resource security, it is further declared that Africa is a market for Chinese products, that China seeks to take advantage of preferential trade agreements between Africa and the North by producing in Africa, thereby also adjusting to resisting trade measures in the OECD against China (Alden, 2005; Besada et al., 2008; Jing, 2009; Kaplinsky & Morris, 2009) and that there are important political and diplomatic aspects, specifically to avoid the recognition of Taiwan and to position China as a “more-understanding partner” and “peacefully developing and responsible rising power” (Davies, 2008; Gill & Reilly, 2007, pp. 36-7).

Focusing on the resource securing aspect of China’s presence in Africa, China’s resource needs are not only reflected in trade data but have also induced a sharp rise in Chinese FDI flows to Africa. It is estimated that FDI outflows are around USD520 million (USD1.5 million in 1991) and that the Chinese FDI stock increased from USD49 million in 1990 to USD2.6 billion in 2006 (Besada et al., 2008). While these amounts are still small in absolute terms, i.e. 1.4% of total inflows, they are rising rapidly and are strongly tied to both trade and aid. In more detail, FDI inflows are directed at resource extracting activities, concentrated to countries with strategic assets, and are delivered in the so-called ‘Angola-model’ fashion<sup>11</sup> under the umbrella of China’s EXIM bank (which has outgrown the World Bank as a credit agency) (Bosshard, 2008). In short, “China’s SOEs implement Beijing’s aid projects, extract strategic natural resources for export back to China ..., and expand their manufacturing bases in China. Chinese workers staff Chinese projects efficiently and at low cost, and Chinese migrants build trade networks and supply chains linking China and Africa” (Gill & Reilly, 2007, p. 38).

The increasing presence of Chinese state-owned enterprises (SOEs) but also private enterprises particularly in extractive sectors and often in countries with weak governance structures, have questioned the environmental and socio-economic impact of their activities. This holds in particular with respect to the hiring of domestic workers (rather than Chinese labourers), the level of compensation and a disregard of adequate working conditions. Furthermore, the exploration of oil and metals, as well as the extraction of resources often take place in previously unexplored territories, requiring the additional establishment of physical infrastructure and thus a significant transformation of the existing

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<sup>11</sup> "The Angola-model refers to cases in which China’s EXIM Bank provides a line of credit, generally at subsidised interest rates [‘aid’]. Large Chinese firms then tender for large infrastructural and resource projects ... Most of these funds are tied to the use of Chinese inputs, and make intensive use of Chinese skills; they also involve investment by Chinese firms in Africa. The bulk of these “aid” funds never leave China but are transferred directly from the EXIM Bank to the (largely SOE) firms which have won the tenders for the work. These funds are not grants, but are repaid by the recipient country as a drawdown on commodity exports back to China” (Kaplinsky & Morris, 2009, p. 13).

landscape, including national parks and fragile ecosystems (e.g. Gill & Reilly, 2007; Yang, 2008). Bosshard (2008, p. 3) states, "China's domestic policies have prioritized economic growth over the protection of the environment, often with harrowing results".

## **1.2 RESEARCH CONTEXT**

China's economic and trade performance over the last two decades can be explained using standard growth models and trade theories. In fact, although sometimes referred to as a growth miracle China's economic expansion largely follows established patterns of the past, such as those of the newly industrialised countries. A general understanding exists about the causes and impact of China's economic growth on international commodity markets. The sharp increase in commodity prices and the rise of commodity exporters' terms of trade is a spectacular turnaround from previous decades. Furthermore, commodity trade flows are being redirected towards China instead of the OECD. The impact of consumption of China's economic expansion is thus of a disruptive nature as traditional patterns of price and terms of trade movements, as well as trade flows, are seemingly reversed.

There is also a general understanding about the effects of China's increasing industrial capacities on other low-income countries' manufacturing industries. In some instances, these changes have a positive impact as exemplified by China's stimulating effect on neighbouring countries' (complementary) exports (Eichengreen & Tong, 2006; Holst & Weiss, 2004; Lall & Albaladejo, 2004). In other cases, the degree of competition has increased as countries' (labour-intensive) manufactured products, particularly those exported by Latin American and SSA, are now competing with Chinese ones in third markets (Dussel Peters, 2005; Kaplinsky, 2008; Mesquita Moreira, 2004).

In general, studies like the ones mentioned in the preceding paragraph document structural changes where "China's opening to trade is interpreted as a shift in world average factor endowments, which altered the comparative advantage of other countries" (Wood & Mayer, 2009, p. 1). Put differently, "China faces another 30 years of continued growth" and "China's economic growth affects relative prices around the world, thereby promoting an increasing division of labor and specialization worldwide. This implies structural changes in countries around the world" (Holz, 2008, p. 1684). However, there are still major gaps in this emerging body of literature, which this dissertation seeks to address.

First, due to the changes in comparative advantage, e.g. due to the release of surplus labour in China<sup>12</sup> and the Chinese-induced changes in commodity markets, studies have highlighted an increasing resource transfer from labour-intensive manufacturing to resource-based production and exports of respective products (e.g. Coxhead, 2007; Eichengreen & Tong, 2006). Studies similar to the ones focusing on manufacturing industries are few and far between regarding natural resources. There is a lack of research focusing on possible structural changes in primary processing industries, natural resource production and trade. Incidentally, studies with respect to the Chinese-induced commodity boom have largely focused on hard commodities, thus re-enforcing the need for research in agricultural raw material sectors.

Second, production and trade are increasingly organised in distinctive value chains spreading across geographic regions. More specifically, there is a pool of literature focusing on developing country producers' integration into global value chains (GVCs) geared towards OECD countries. While China is best known as a dominant exporter, it is simultaneously a large consumer country of final products and a processor of intermediate inputs. As a result, trade flows may be redirected away from the OECD towards China, or indeed that altogether new Chinese-dominated GVCs emerge. Detailed case studies using the GVC framework to identify possible changes in developing countries' industries because of a shift in final markets are still scarce.

Third, Chinese industries have not only attracted an ever increasing share of global foreign investments, they are themselves a source of finance and investors especially in light of current and future resource security. The first section of this chapter paid tribute to the literature on China's engagement with Africa through the vectors trade, aid and foreign direct investment. While there is a growing body of literature documenting Chinese producers' activities in extractive industries abroad, and while there are many case studies discussing activities of large transnational companies (TNCs) in developing countries, hitherto no comparative studies directly contrast Chinese producers with both established TNCs and domestic producers.

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<sup>12</sup> China releases 0.01 percent of agricultural labourers into manufacturing industries per annum and is estimated to hold a reserve army of labour of more than 150 million (Holz, 2008; Kaplinsky & Morris, 2008).

### **1.3 RESEARCH HYPOTHESIS AND QUESTIONS**

The research hypothesis states that given the organisation of production and trade in global value chains coordinated by dominant chain actors, a redirection of trade away from traditional buyers in the North towards the emerging economy of China will lead to transformations in the governance and organisation of increasingly Sino-driven global value chains. Changes are likely to be disruptive to existing developmental axioms. Furthermore, the growing presence of Chinese producers in Southern resource industries has the potential to accentuate structural changes in the organisation of production, because Chinese actors' activities are said to be concentrated in the extractive rather than the processing stages of production, often in disregard of socio-environmental consequences. In order to have an organised approach to answering the overarching research hypothesis the following research questions are of guidance:

1. Can we observe a significant shift in agricultural raw material trade flows that are redirected away from traditional consumer countries in the North towards China?
2. Does the Chinese market differ from established markets in the North, and how does this translate into buyer requirements and standard setting?
3. Given the influx of Chinese capital into producer countries, are there marked differences in the activities of Chinese-owned producers and either or both domestic and non-Chinese, foreign-owned ones? Is this because of dominance of ownership of production or the ownership of final markets, i.e. are producer activities determined by nationality, markets, or both?
4. Do any of the above differences lead to significant changes in the structure and governance system of the domestic value chain?
5. What are the growth and developmental impacts arising from these changes?

### **1.4 RESEARCH FOCUS: GABON'S FORESTRY INDUSTRY**

To have a realistic chance of a detailed assessment of each of the research questions, that is to say within the given period and with the required rigour of a PhD research, a case study analysis will be undertaken focusing on one natural resource sector in a single producer country: the domestic tropical timber industry in Gabon.

Tropical timber is of strategic interest to China, because, in line with Chinese demands for other

commodities, wood is fuelling domestic processing industries such as the plywood and wood furniture sectors. It is also a direct input into the construction sector (driven by an expansion of physical infrastructure and housing). In general, China is now being referred to as the 'wood workshop of the world', thus requiring large volumes of inputs both for domestic consumption and export markets. In total, private and industrial consumption in China, next to export demands, have outstripped domestic wood production capacities (additionally constraint by a government forest protection programme) to such an extent that China is increasingly depending on imported wood.

Chinese industries source a dominant share of their tropical log imports from five countries: Malaysia, Papua New Guinea, Gabon, Myanmar and Indonesia. Gabon is the largest African export location of tropical timber consumed in China. In turn, China is now the largest buyer of tropical logs from Gabon. Traditionally, the countries of the European Union in general and France (its ex-colonial ruler) in particular are Gabon's strongest trading partner. As is true in general for commodity demand from the North, the market (excluding China) for primary timber is contracting since the 1990s. Focusing on the tropical timber industry in Gabon thus enables an analysis of the impact of changes in final markets away from the OECD (with residing resource needs) towards China (with increasing demands for natural resources).

Focusing on a natural resource producer in Africa, Gabon, addresses the research literature on low-income countries' commodity dependence due to low commodity prices and discriminating terms of trade movements, now challenged by the non-marginal impact of China's industrialisation, and an apparent shift in comparative advantage according to the consumption and production patterns of China instead of the OECD. As mentioned above, a sector other than metal was selected, because research in Sino-affected agricultural sectors is still scarce. Additionally, the oil and metal sectors are often described to be of an enclave nature with few horizontal and vertical linkages to the rest of the economy. Contrastingly, the forestry industry is regarded as an important tool for industrialisation and economic growth for developing countries, given their natural advantage in growing wood for commercial purposes as well as employment possibilities at both the extractive and the processing level (e.g. Bazett, 2000; Westoby, 1987). In Gabon, the forestry industry is one of the strongest sectors in terms of economic contributions (next to the oil industry) and is the second largest employment sector after the state.

## **1.5 DISSERTATION OUTLINE**

In this section, the thesis' chapter outline is presented. Each chapter is briefly introduced as a short description of the major sections of each individual chapter is stated.

### **Chapter 1 Introduction**

The dissertation starts with an introduction to manufacturing-based industrialisation as the fundamental developmental framework. The discussion subsequently presents China as an emerging economy at a resource-intensive stage of growth with disruptive impacts concerning some aspects of industrialisation, i.e. commodity prices, commodity exporting countries' terms of trade, commodity trade flows and the international division of labour. Next, China's engagement with resource-rich countries in Sub-Saharan Africa is documented. These sections set the research context from which the research questions are formulated. The fourth section introduces Gabon and its domestic forestry industry as a case study.

### **Chapter 2 The Role of Natural Resources in Economic Development and the Global Value Chain Framework**

The first part of this chapter provides an overview of the theories related to economic growth and development, with a particular focus on the role of natural resources and factor utilisation. It thus provides the theoretical context but also enables us to draw linkages to development policy and conclusions with respect to the outcome of this research. The second part introduces the global value chain framework as a method of analysing industries and individual actors, as well as their integration in global production and trade.

### **Chapter 3 Research Methodology**

This chapter presents the methodologies used in this thesis to retrieve and collect data, such as the collection and discussion of secondary data from publicly available documents and databases. Additionally, primary data were collected during fieldwork in Gabon through interviews and a questionnaire. The design of the questionnaire, the collection process of primary data and the representativeness of the collected data are discussed in the third section of this chapter.

#### **Chapter 4 The Global Tropical Forestry Industry and Patterns of Consumption**

The chapter provides an overview of the global tropical timber industry, i.e. the major producers and consumers of tropical timber and wood products. The following sub-section evidences a shift in global tropical timber trade flows due to China's significant impact of consumption of tropical timber. The next two sections show that whilst final markets in China are at an industrial stage of forest usages, countries in the North have entered a post-industrial phase of forest usage. The chapter concludes with an overview of the global forestry governance system.

#### **Chapter 5 Gabon and its Domestic Forestry Sector**

The first section provides an introduction to Gabon's economy and its industrial landscape, in particular the economic contribution of the domestic tropical timber industry. The subsequent section introduces the rationale of and recent changes to the sectors' legislative framework (including influences from the global governance system). The chapter proceeds with a discussion of the tropical timber sectors' production profiles, both of raw materials and processed products, as well as time series of international prices. Changes in production over time are linked to demand of dominant final markets.

#### **Chapter 6 Chinese and European Buyer Standards and Market Access**

Based on the notion that the tropical timber chain is buyer-driven and that differences in demand of final markets are reflected through key buyers in producer countries, the next sections compare buyers in China and Europe through a discussion of three groups of standards. These standards are firm-specific performance criteria, international regulations and standards defined by civil society. The final section presents results of producers' self-assessments, i.e. the ability of producers in Gabon to conform to European standards and those set by Chinese buyers each.

#### **Chapter 7 Gabon's Tropical Timber Value Chain and Chinese Producers' Integration**

This chapter focuses on the Chinese-induced changes in the organisation of Gabon's tropical timber value chain. For this reason, the opening section first maps the domestic tropical timber value chain. The second section identifies groups of producers and discusses differences between these producers based on a number of variables. Linked to the previous discussion, special attention is given to the activities of Chinese satellite companies in the forestry industry in Gabon in the third section of this chapter. The fourth section discusses the impact of existing industry barriers to entry and national

legislation on the observed division of labour.

## **Chapter 8 Income Distribution and Simulation Exercise**

The first section of this chapter analyses the distribution of value-added along the tropical timber value chain in Gabon. The empirical findings are discussed in light of the concept of economic rents. Furthermore, results obtained here are linked to earlier findings with respect to changes in the structural division of labour. The second section simulates how the shift in final markets of tropical timber influences the domestic utilisation of factors of production, i.e. it is assumed that only a single market exists and that all domestic resources are channelled into this market's respective sub-chain(s).

## **Chapter 9 Conclusion**

The thesis concludes with a summary of research findings explored in the previous analytical chapters and relates these to the theoretical discussions with respect to changes in the organisation of Sino-driven global value chains, i.e. the research findings provide the answers to each of the five research questions, which ultimately determine whether the research hypothesis can or cannot be rejected. The following section reflects on the impact of research outcomes to the existing body of literature of natural resources' roles for economic development and implications for development policy formulation. The chapter closes with a discussion on further research.





## CHAPTER 2 THE ROLE OF NATURAL RESOURCES IN ECONOMIC DEVELOPMENT AND THE GLOBAL VALUE CHAIN FRAMEWORK

Everyone needs to use natural resources for their very existence. We suffocate unless we breathe air, we need to drink clean water regularly to prevent our body from dehydrating and we consume food to maintain our energy levels. Since the Neolithic Revolution, people begun to build houses made of clay, stones, timber, reed and other building materials that were traditionally found on location. The tools used to build these houses were provided by nature and so were the majority of the input materials to the clothes people wore. For example, leather and fur are a by-product from the slaughtering of animals for consumption. Still, not only individuals or even a small group of individuals jointly profited from natural resources, entire nations and world superpowers were founded on the existence of precious stones, minerals, metals, agricultural raw materials, as well as gas and oil.

The intensified usage of natural resources for consumption and trade symbolises a change of the demands people made of natural resources. Over time, they increasingly required processed materials for final consumption. In turn, this necessitated the application of human manpower, capital and finances. Indeed, the very first mathematical equation of a production function by Johann van Thünen in the 1840s related outputs of agricultural production to inputs of labour, capital and fertility of soil<sup>13</sup>. Today, the basic production function describes output as a function of capital and labour. In general, the variable land has vanished from much of economic thinking, while made and human capital play a decisive role for economic growth. One simple explanation for this is that due to rapid technical progress “just as we were wondering whether the [Malthusian] devil of population pressure could be kept at bay much longer, we looked over our shoulders, and lo and behold! - he was gone” (Robertson, 1938, p. 5).

Technological advances derived from the application of science to problems of production marked the beginning of the so-called modern economic growth period with made and human capital factor accumulation, as well as technical change fostering the growth process. This is also highlighted by Adelman (1999, p. 18) stating that “... all LDCs (less-developed countries) stressed accumulation [of

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<sup>13</sup> See Lloyd (2001) and Mishra (2007) for an overview of the history and controversies of production functions.

human and physical capital] as a sine qua non for development ...”, though different accumulation patterns resulted in “achievement of comparative advantage in either labor or capital intensive exports”. As emphasised in the introductory chapter of this thesis, the focus on factor accumulation in manufacturing industries, i.e. industrialisation, is the prevailing core development strategy. Countries with predominantly commodity sectors often stagnated in terms of economic progress.

## **CHAPTER OUTLINE**

The opening paragraphs of the first section provide a brief overview of today’s general concept of economic growth and development, as well as of the variables that enable and drive these processes. The review continues with a discussion about the role of natural resources for economic development over time. The first section also pays attention to the prevailing international division of labour at respective moments. The second section introduces the global value chain (GVC) framework as a method to study industries and their integration into global production and trade. Guided by the thesis’ research questions, the discussion is limited to selected GVC themes such as the role of lead firms and standards. Both sections also establish what the conventional ‘development framework’ is, summarised in the concluding section of this chapter, so that it is possible to assess whether China’s economic growth pattern is disruptive, particularly in light of this thesis’ focus on timber and Gabon’s domestic forestry industry.

### **2.1 RESOURCE-BASED GROWTH AND INDUSTRIALISATION**

Modern economic growth is usually defined as an increase in income, is associated with relatively high initial levels of human and made capital and is correlated to the following variables: geography, political systems, colonial legacy, economic organisation and market regimes, investment, as well as trade openness (Barro, 1991; Dollar & Kraay, 2004; Levine & Renelt, 1992; Lucas, 1988; Mankiw et al., 1995; Sala-i-Martin, 1997). Economic development is widely characterised as arising from economic growth and is accompanied by structural change. In general, “The concept of development and the process of industrialization often have been treated as synonymous ...” (Perkins et al., 2001, p. 652). The road to growth via industrialisation is path dependent moving from agriculture towards manufacturing industries and eventually to the service sectors as the main source of income (Syrquin & Chenery, 1989).

These successive transitions have been theorised in the structural-change theory and in the linear-stages-of-growth model. Though based on different assumptions, for example Lewis' two-sector model (1954) applies only to economies with a surplus of labour, modern economic growth models identified a common set of enabling variables. In more detail, structural change is facilitated by technological innovations, infrastructure, investment to finance capital accumulation, as well as the ability of society, especially entrepreneurs, and institutions to adjust to and take advantage of the new economic framework (Clark, 1940; Fisher, 1939; Kuznets, 1966; Rostow, 1959; Syrquin & Chenery, 1989). Changes in the structure of industrialising economies are reflected in shifts in sectoral employment distribution and are associated with socio-economic developments such as urbanisation.

Another consequence of technological advances is the rise of productivity and efficiency of all factors of production. However, capital has in general made the dominant contribution to labour- and capital-productivity<sup>14</sup>. Put differently, compared to agriculture and many services technical innovations are absorbed most productively by capital, because it exhibits increasing returns and has the highest sensitivity to economies of scale (Echevarria, 1997; Kuznets, 1973). The Industrial Revolution symbolises the start of an era of capital and labour transfers to manufacturing industries emerging at the time. The shift in resource allocation fundamentally changed the comparative advantage of countries in Western Europe in favour of capital-intensive sectors with high rates of labour productivity. In fact, "The period from the industrial revolution to World War I can be viewed as the period when the fundamental characteristics of the ... international division of labor were cemented ... an industrial core was created which traded with primary producers in other parts of the world" (as cited in Barbier, 2005b, p. 133).

### **2.1.1 PRIMARY-EXPORT-LED GROWTH AND THE STAPLE THESIS**

The new economic framework that emerged in the Industrial Revolution in Western Europe in the 19<sup>th</sup> and early 20<sup>th</sup> century provided the possibility of using primary exports as the engine of growth for resource-rich countries. In other words, developing countries were thought to profit from trade with rapidly expanding, industrialising markets in general and with products made of the South's' abundant factor of production in particular. Prebisch noted of the then prevailing assumption of the division of

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<sup>14</sup> Today's (endogenous) growth models acknowledge that capital accumulation is the strongest driver of economic growth especially for developing countries, whilst total factor productivity, capturing variables such as level of technology, policies and institutions, as well as human capital formation can play a decisive role in the growth process in general (Collins et al., 1996; Lucas, 1988; Mankiw et al., 1992).

labour: “The countries producing raw materials obtain their share of benefits [of technical progress] through international exchange, and therefore have no need to industrialize” (1950, p. 1). The exportation of food and raw materials in exchange for manufactured goods was believed to result in economic growth in primary exporting countries through an improved utilisation of domestic factors of production, an expansion of factor endowments and through linkage effects, all of which are to some degree mirrored in the staple thesis.

In his study on the historic regional development in the USA, North (1955) argued that economic development was determined by the positive exploitation of the region’s comparative advantage of staples demanded by world markets and of relative costs of production of these commodities. Cost competitiveness had been achieved through the regional emergence of improved credit and transport facilities, progress in the technology of production and trained labour. The work by North and similar descriptive studies of Canadian natural resource sectors by Mackintosh (1923; 1939) and Innis (1940; 1933) were pivotal in shaping the staple thesis. It postulated that staples can be initial engines of growth given strong overseas demand, a limited domestic market, the existence of unexploited natural resources and a high man to land ratio. In this thesis, absent domestic factors of production are imported in exchange for the country's staple. The model hypothesises that sustained economic development is achieved by a diffusion of activities around the export base and thus through the flow of investments into complementary domestic sectors over time<sup>15</sup> (Bertram, 1967; Buckley, 1958; Watkins, 1963).

Due to the staple theory's geographic limitations to regional growth and its strong assumptions mentioned above it has only limited universal application across a large spectrum of countries and over time. To be more precise, scholars argue that it is only relevant for “the atypical case of the new country” (Watkins, 1963, p. 143) like the USA and Canada. Still, even more generalised models of economic growth in light of resource-rich economies such as the vent-for-surplus theory (Myint, 1954, 1958) apply assumptions similar to those of the staple thesis. This theory asserts that hitherto isolated economies would benefit from trade participation (with the North), because excess (unproductive) land

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<sup>15</sup> A diffusion of activities is achieved through linkages, where “backward linkages lead to new investment in input-supplying facilities and forward linkages to investment in output-using facilities” (Hirschman, 1981, p. 65). Watkins (1963) describes spread effects as impacts of export-orientated activities on both the domestic economy and society. For example, given technology “a number of things follow: demand for factors; demand for intermediate inputs; possibility of further processing; and the distribution of income” with the degree depending on domestic investment opportunities or diversification of staple sectors” (pp. 144-145).

and labour would then be absorbed by the trade-participating sectors<sup>16</sup>. Similarly, growth models based on the frontier thesis anchor their analysis on the existence of abundant land with prospects for an outward push of the extensive margin, as well as respective inflows of capital and technology (Barbier, 2005a; di Tella, 1982).

Many authors, like Barbier (2005b), Findley and Lundahl (1999) and Wright (2001) refer to the years 1870 until 1913 as the Golden Age of resource-based development. However, as outlined above, sustained growth and development was largely confined to the 'regions of recent settlement'. Furthermore, demand-driven growth in the South was limited to countries with plantation and/or peasant-based sectors (e.g. Brazil and Malaysia), as well as to mineral-rich countries such as Chile and South Africa (Findlay & Lundahl, 1999). Resource-based development in the pre-world war time was thus limited to countries with unexploited resources and/or Ricardian land 'frontiers'. Most important of all, economic growth was dependent on the developing economies in the North as the "economic boom was precipitated by the export-led industrial expansion in Western Europe and the United States" (Barbier, 2005b, p. 129). Today, "opportunities for resource-based growth are more limited now than they were in the pre-1914 era" (as cited in Wright, 2001, p. 3). This is because the North eventually exited its resource-intensive stage of growth and progressed into a dematerialising, increasingly services-driven, phase.

With time, both the volume and composition of demand in the North changed as incomes continued to rise. To give an example, Cohen (1968, p. 339), using international trade data for the years 1952-54 and 1962-64, shows that for the key northern economies "no major primary product had imports growing as fast as the average non-primary product". The annual growth rate of all commodities in aggregate imported by the USA, Canada and Western Europe was 6.9%; however, the one for manufactures was 12.6% compared to 3.3% for primary products. The underlying reasons for the observed stagnation of natural resource demand growth are six fold: i) increasing industrial outputs with lower import contents, ii) protection of domestic agricultural sectors, iii) increasing share of

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<sup>16</sup> The theory is attributed to Adam Smith and John Stuart Mill arguing that participation in international trade enables the usage of the unused (surplus) resources. Myint applied the theory specifically to the group of low-income countries entering international trade through the application of surplus land and labour (the assumed unproductive, abundant factors). Myint asserted that the 'post-absorption' phase is often one of ceased economic growth due to low rates of capital formation and technological change (Brown & Hogendorn, 1972; Kurz, 1992; Myint, 1977).

services in national incomes, iv) low income elasticity of consumer demand for agricultural products<sup>17</sup>, v) increasing use of synthetics and vi) rising production efficiencies requiring less raw material input (Cohen, 1968; Nurkse, 1952, 1962).

### 2.1.2 THE PREBISCH-SINGER THESIS

Challenging the then prevailing conventional wisdom, Prebisch (1950; 1959) and Singer (1950) observed that the prices of primary products exported by the South decreased relative to the prices of manufactured goods, which developing countries import from abroad. The price deterioration was attributed to falling volume requirements due to technical changes in production of manufactures requiring fewer raw materials and to low-income elasticities of demand for primaries (described above). Declining primary product demand results in a surplus production and thus a fall in relative prices<sup>18</sup>. Furthermore, the price deterioration was thought to result from differences in how benefits from technological progress are translated to the respective domestic economy, i.e. in Western Europe technical progress was reflected in rising incomes, while in developing countries it resulted in a fall of product prices. Differences in technical progress 'transmission' are due to variations in the organisation of goods and labour markets. Surplus labour suppresses wages rates to the subsistence rate in the South, whereas the strong bargaining power of labour and the existence of barriers to entry allowed prices to be set at a cost-plus basis in (oligopolistic) manufacturing industries (Kaplinsky, 2006b; Ocampo & Parra, 2003; Prebisch, 1950; 1959; Singer, 1950).

Empirical evidence brought forward in the last decades confirms the relative fall in primary product prices of around 0.5 percent per year<sup>19</sup>. It is not possible to give a detailed account of the research surrounding the terms of trade thesis in light of space limitations<sup>20</sup>. Yet, with respect to the implications for development theory it is important to note that the Prebisch-Singer thesis itself not only contested the dominant belief until then of rising barter terms of trade but the authors also used it as proof that "reality is undermining the out-dated schema of the international division of labour" (Prebisch, 1950, p. 3). In other words, they observed that the benefits of trade participation based on the assumption of

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<sup>17</sup> Bond (1987) calculated that the aggregate income elasticity in the North for food was 1.2, for beverages and tobacco it was 0.68, for agricultural raw materials it was 0.56, for minerals it was 2.16, and for energy it was 3.53.

<sup>18</sup> Additionally, a given low price elasticity of demand means that in order to keep the share of primaries in the Northern trade partner's total imports at least constant it can only be achieved through a disproportionate fall in respective export commodity prices.

<sup>19</sup> Based on visual inspection and simple log regression results but statistically insignificant based on unit root tests (Brahmbhatt & Canuto, 2010; Cuddington et al., 2007).

<sup>20</sup> See e.g. Greenaway and Morgan (1999) for a comprehensive collection of articles.

comparative advantage in natural resources were in fact insignificant<sup>21</sup>. They concluded that technical progress failed to translate into sustained economic growth in primary-exporting countries. If economic development through primary-export-led growth is not viable, the only alternative route would in fact be through industrialisation<sup>22</sup>.

### **2.1.3 NATURAL RESOURCE COMMODITIES AND INDUSTRIALISATION**

To recapitulate, the work by Prebisch and Singer showed that the terms of trade are deteriorating for primary product exporting countries, accompanied by high price volatility bearing substantial risks and consequences for resource exporters' real incomes, fiscal position and macroeconomic stability (e.g. Ocampo & Parra, 2003). The comparative advantage in trading with natural resources was negated. Various authors stressed the observation of falling private consumption of primary products as incomes rise, as well as receding raw material consumption by industries due to technological efficiencies and a transition towards less resource-intensive stages of growth, i.e. because of structural change in the North. Primary sectors were believed to have decreasing rates of return, while the industrial sector inhibits increasing returns. In addition, the Harrod-Domar growth model introduced in the 1940s stressed the role of capital accumulation (next to technical change) to economic growth (Domar, 1946; Harrod, 1939). The model seems to have been affirmed by the success of the Marshall Plan in post-war Western Europe.

Given this set of knowledge, the role of natural resources as an engine of growth was consequentially dismissed in favour of industrialisation in general and capital accumulation in particular. Nevertheless, natural resources were thought to be "necessary for economic development ... [as] their value usually includes a high proportion of land rent" (Prebisch, 1950, p. 8). Similarly, economists like Ginsburg (1957, p. 204) ascertained that primary exports can be "an agent for rapid capital formation". He continues, "The possession of a sizable and diversified natural resource endowment is a major advantage to any country embarking upon a period of economic growth". Yet, "in no sense ... are natural resources responsible for development and economic growth; they possess no deterministic power ..." (pp. 211-212). Natural resources had hence become tradable commodities to earn the necessary foreign exchange that would allow the financing of the industrialisation process.

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<sup>21</sup> The distribution of benefits of technological progress was at the core of their analysis. It was only due to a lack of data that prices of exported natural resources and prices of manufactured goods were used as proxies to discuss the former, i.e. the discrepancies in income between developing countries and the industrial centre.

<sup>22</sup> Especially in the case of Latin America an industrialisation process through import-substitution (Adelman, 1999; Birdsall et al., 2010; Prebisch, 1959; 1981).



The popular consensus was one of an industrialisation development path away from primary product exportation and in clear favour of manufacturing. Space limitations and the overall focus of this chapter do not allow for a detailed discussion about the various branches of development economics with respect to industrialisation, including policy formulation, as well as the numerous industrialisation options and their sequencing as practiced over time and across countries<sup>23</sup>. In general, those countries that first developed significant manufacturing industries often competed globally with a comparative advantage in labour-intensive products. With time, these economies moved up the comparative advantage ladder from labour-intensive, via skill-intensive and capital-intensive manufacturers, towards research and development or innovation-intensive activities (Adelman, 1999; Findlay, 1996; Ozawa, 2005). This also means that the engine of economic growth through capital accumulation is complemented by human capital and technological innovation.

The first wave of newly industrialised countries (NICs) in East Asia, like Hong Kong, Taiwan, South Korea and Singapore, set impressive examples of how the transition towards industrial manufacturing activities with comparative advantages other than natural resources, plus an opening-up to embrace export-led growth can be achieved. The NICs' success vitiated the recommendation for import-substitution industrialisation popular in the 1970s and the neo-classical belief of a minimised role of the state. Moreover, it broke the pattern of the former international division of labour. Increasing numbers of developing countries established manufacturing sectors and, due to their relative labour cost advantage, attracted investments from the North. The so-called flying geese pattern of development unfolded "whereby more advanced countries pass on their less technologically advanced industries to other countries as their labor costs rise and their comparative advantage shifts" (Reinhardt, 2000, p. 58).

#### **2.1.4 THE RESOURCE CURSE AND RESOURCE-BASED INDUSTRIALISATION**

At the same time, researchers observed that the NICs have had very few natural resources previously thought to be advantageous towards development. Even more, cross-country growth regressions revealed that natural resource abundance is inversely related to economic growth<sup>24</sup>. Sachs and Warner

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<sup>23</sup> See e.g. Adelman (1999) demonstrating how different regions and countries assigned higher weights to different factors of production over time; or Findlay and Lundahl (1999) for a 'categorisation' of countries into groups of distinct strategies of industrialisation; and Shafaeddin (2005) for an analysis of industrialisation 'successes' among a range of developing countries.

<sup>24</sup> Auty (1993; 1994; 2001), Davis (1995), Gylfason et al. (1999), Humphreys et al. (2007), Ranis (1991), Sachs and Warner (1999, 2001)

(1995, Section 1, para. 3) also noted, "Even if natural resources are no longer a decisive advantage to economic growth, it is surely surprising that they might pose an actual disadvantage". The results established the notion of a so-called resource curse. Countries abundant in natural resources are thought to suffer from discriminating terms of trade, price volatility and Dutch disease effects. Furthermore, because of a concentration on natural resources a crowding out of manufacturers takes place prolonging infant industry protection and the transition towards competitive industrialisation. Many industries were also observed to fail to diversify and to create domestic linkages. Numerous social (funding of civil wars) and political factors (institutional quality, political economy, rent seeking, etc) are pointed out as significant, too<sup>25</sup>.

On the one hand, it is often said that the resource curse is a stylized fact (Davis, 2008b; Wright, 2001). On the other hand, a growing number of scholars question the notion that there is an inherent curse-like quality to all natural resources (e.g. Lederman & Maloney, 2007). With respect to economic factors, there are known macroeconomic policy tools to mitigate Dutch Disease effects and the satisfactory application thereof. Furthermore, it seems that countries struggling in the 1980s because of a fall in commodity prices did so because of a "Debt overhang and inappropriate risk management ..., and nothing else" (Davis, 2008a, p. 244). Moreover, it is often policy failure or the political economy of a country rather than the resource per se that is the crux of the problem (Gunton, 2003; Rosser, 2006). The criticism is further supported by contradicting econometric results based on alternative independent variables<sup>26</sup> (Brunnschweiler & Bulte, 2008; Lederman & Maloney, 2008).

Case studies of resource-based industrialisation evidence that natural resources are not cursed or constrained to the role of foreign exchange earners. For instance, in relation to a research project in Latin America, the authors conclude that "... rich endowments of natural resources, combined with the aggressive pursuit and adoption of new technologies, are a proven growth recipe" (de Ferranti et al., 2002, p. 10). Reinhardt (2000), studying Thailand and Malaysia, reports that resource-based sectors contributed significantly to these countries' growth success as resources were used as inputs into higher value-added productions. Similar conclusions were made by Jomo and Rock (1998), who argue that diversification of activities and resource-based manufacturing activities were important drivers of

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<sup>25</sup> See for example Lederman & Maloney (2007), Robinson et al. (2006), Ross (1999) and Rosser (2006).

<sup>26</sup> For instance, Lederman and Maloney (2008) argue that both the applied statistical method (e.g. controlling for endogeneity and fixed effects) and the measure of resource abundance (e.g. either net or gross natural resource exports as a share of GDP, natural resource exports over total merchandise exports, or share of natural resources exports in total exports) differ across studies but significantly alter research results.

economic growth for Malaysia, Thailand and Indonesia. Moreover, Owens and Wood's (1997) analysis of the 'exportability' of the Asian manufactured export success revealed that the outcome depends critically on the inclusion of processed primary products and the labour forces' skill levels. Complementing these results, Stijns (2006) showed that economic growth and resources abundance are further correlated with human capital accumulation.

Overall, these case studies confirm that natural resource sectors can decisively foster economic development. However, this statement is conditional depending on the diversification of activities (e.g. through horizontal linkages, further processing and/or the usage of resources into domestic manufacturing industries), on complementary factor accumulation (especially human capital and technology) and on the state, because "a state's institutional capacities and effectiveness exert a critical influence over whether extractive economies work in the interest of development" (Bridge, 2008, p. 393). In contrast, Innis' (1956) statement that specialisation in raw material extraction (and thus primary exports) can pronounce a dependent form of development, also referred to as 'staple trap', is likely to expose the sector (and in case of commodity dependency the economy at large) to unfavourable price movements, price volatility, and discriminating terms of trade movements.

### **2.1.5 CONCLUDING REMARKS**

The preceding sections provided a brief overview of the role of natural resources in economic growth and development over time. The discussion focused on the believed and real comparative advantages of resource-rich countries on a global scale. The analysis also highlighted which other factors of production contribute towards economic growth. The dismissal of natural resources as a key growth contributor, or a deterministic variable, is embedded in a development framework with industrialisation at its heart and with capital accumulation, complemented by human capital, investments and technological progress, as the engine of growth. A manufacturing-based industrialisation path, in particular the expansion of labour-intensive production in early stages of economic growth, is the current dominant developmental framework for low-income countries.

This reasoning holds true for both non-resource and resource-based manufacturing sectors that each compete on dynamic comparative advantages according to their position on the global comparative advantage ladder. Yet, this ladder was constructed by industrialised countries in the North, because

they have largely determined the economic framework, as well as the structure of production and trade on an international scale. As already stated in the introductory chapter of this thesis, “For the past hundred years the rate of growth of output in the developing world has depended on the rate of growth of output in the developed world” (Lewis, 1980, p. 555) as the OECD was the dominant consumer of natural resources. Furthermore, the activities of manufacturers in developing countries are largely determined by the North, both in terms of size and spending power of this aggregate market relative to small domestic ones, as well as because firms in advanced economies dominantly control the structure of production and trade, increasingly organised in global value chains, on an international scale (see Section 2.2 below).

The opening-up of the Chinese economy increased the global supply of labour thereby challenging labour-intensive manufacturing industries elsewhere (see Chapter 1). Global factor prices and thus the international division of labour have been severely disrupted as a further consequence. China’s significant commodity consumption reversed the historic fall of many primaries’ export prices. The consequence is a disruption to the terms of trade movement, which for long discriminated commodity exporting developing countries. Moreover, China has just entered a resource-intensive stage of growth. There are thus reasons to believe that a new economic situation has emerged, where the assumption of stagnating resource demand growth in the North may become obsolete as final markets shift to China.

## **2.2 THE GLOBAL VALUE CHAIN FRAMEWORK**

The first section discussed the enabling variables to sustained growth via industrialisation. The NICs and China demonstrated that specialisation in production and the participation in international trade can result in sustained economic growth provided a continuous and dynamic transition towards sectors and activities with comparative advantage, with China increasingly defining other low-income countries’ comparative advantage vis-à-vis their factor endowments, industrial capacity and requirements. Countries across the world are now connected through trade linkages and trade participation is regarded as a growth-enhancing prerequisite. Since developing countries began to embark on the process of industrialisation their combined share in total world exports increased continuously from 16% in 1986 to 30% in 2008 (Milberg & Winkler, 2010). However, these economies did not necessarily trade in final manufactured products as assumed in standard trade theory.

To the contrary, developing countries' industries are often involved in the production of intermediate goods and components (including China, see Chapter 1). As Feenstra summarises, "The last few decades have seen a spectacular integration of the global economy through trade ... [still] the rising integration of world markets has brought with it a disintegration of the production process ..." (1998, p. 31). As a result of this shift in production, economies now have kaleidoscope comparative advantage so that [knife-edge] specialization ... shifts among countries with small changes in cost conditions" (Bhagwati, 2010), hence creating the flying geese pattern of development introduced in the previous section. The disintegration of production was referred to it as the slicing of the value chain, or "to produce a good in a number of stages in a number of locations, adding a little bit of value at each stage" (Krugman et al., 1995, p. 334), while Leamer (1996) termed it a process of delocalization.

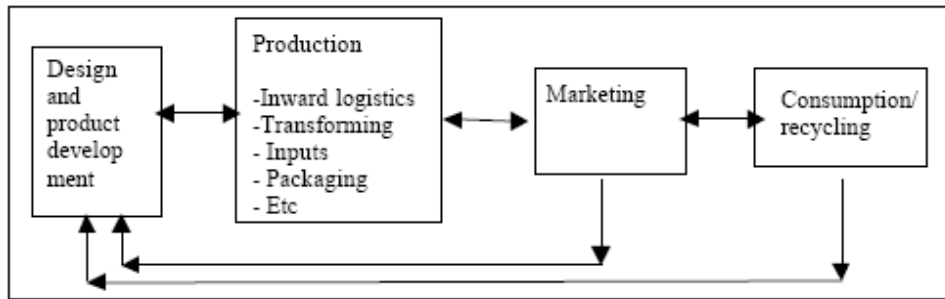
The global value chain framework takes the fragmentation of production as given and describes the production itself as sequenced activities along a value-adding chain (Figure 2-1). Yet, in contrast to macroeconomic trade theory (and thus not to be confused with Krugman's wording in the preceding paragraph), the global value chain (GVC) framework explicitly addresses the role of industry and firm-level decisions (though to a lesser degree the role of institutions) in defining the structure of production globally and of countries' domestic sectors in particular. To be precise, early work by Gereffi (1994)<sup>27</sup> was motivated by the observation that firms in industrialised countries created capacities in low-income countries to which segments of production had been outsourced, although maintaining control of key resources.

Another central feature of Gereffi's early work (1994, 1999) was the descriptive analysis of global (manufacturing) commodity chains (later renamed global value chains) as input-output segments of production and the geographic location of each processing step (see also Sturgeon, 2007). A global value chain depicts "the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use" (Kaplinsky & Morris, 2007, p. 4). Using the GVC framework allows the identification of industry actors, the mapping of their positions, accounting of individual actors' activities, and thus deriving at the given structure of production at an industry- and firm-level.

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<sup>27</sup> The research by Gereffi built on the work of Hopkins and Wallerstein (1977, 1986) discussing global production systems, particularly the role of the state in shaping the latter.

**Figure 2-1** A simple value chain



Source: Kaplinsky & Morris (2007, p. 3)

The mapping process of specific a value chain simultaneously results in a spatial division of labour describing nodes of production and the geographic location thereof, albeit frequently resulting in a more non-linear depiction than the simple value chain shown in Figure 2-1. Moreover, the length and breadth of a chain varies strongly across industries. To give an example, the automobile industry sources thousands of inputs from as many suppliers and the car manufacturing process itself involves numerous steps of production, while often agricultural products (and thus perishable goods) are characterised by relatively 'short' chains. To our knowledge, the domestic tropical timber value chain in Gabon, introduced as an 'African' case study industry in the opening chapter of this thesis, has hitherto not been mapped. One of the key exercises in this thesis is thus to construct the latter. However, in order to understand the reasons for the observed patterns of production it is necessary to have an understanding of governance and linked to this foreign buyer (and institutional) standards.

### **2.2.1 THE CONCEPT OF CHAIN GOVERNANCE**

The GVC literature regards the disintegration of production into distinct segments as a break with the traditional pattern of a vertically integrated 'Fordist' mode of mass production undertaken by a single enterprise. The necessity to coordinate specialisation on location is dismissed due to substantial improvements of communication and information technologies, as well as falling transportation costs and regulatory barriers like tariffs (Gibbon et al., 2008; Milberg & Winkler, 2010). Moreover, consumer tastes in the North developed over time and with rising incomes with respect to product variety, innovation and quality, forcing producers to diversify their products and/or to create niche markets (Humphrey & Schmitz, 2008; Piore & Sabel, 1984).

Consequently, the degree of competition globally increased and led to a deepening of specialisation and concentration, which provoked Northern companies to outsource their non-core (low return)

competences that did not require on-site supervision/communication to external suppliers (see e.g. Altenburg, 2006; Gereffi et al., 2005). At the same time, the overall result from a producer's perspective was that "production chains had to be "governed", to be coordinated in manners which allowed differentiated consumer needs to be met through complex and disarticulated production systems", given a lack of market knowledge and/or technical competence by the suppliers (Altenburg, 2006; Dolan & Humphrey, 2000; Kaplinsky & Morris, 2007, p. 7).

Governance describes the often asymmetric relationships between actors of a value chain with varying degrees of power to each other. The focus of most studies is on inter-firm relationships also referred to as chain governance. The reason for this 'selectivity' is that the GVC framework rests on "the assumption that ... inter-firm trade have recognizable dynamics, they do not occur spontaneously, automatically or even systematically. Instead, these processes are initiated and institutionalized in particular forms as a result of strategizing and decision-making ..." (Gibbon et al., 2008, p. 319; Sturgeon, 2007). More specifically, case study research showed that production and purchasing decisions affecting a respective value chain are in most cases made by lead firms such as large retailers, global buyers and branded companies (e.g. Dolan & Humphrey 2000, 2004, Gereffi, 1999; Schmitz & Knorringa, 2000). For instance, Nike's core competency lies in branding and design, whereas the production of the various products it offers are undertaken by external producers according to Nike's designs and specifications (Humphrey & Schmitz, 2008).

The GVC framework offers tools to study firm-to-firm relationships and thus the prevailing inter-firm governance structure of the value chain under investigation. Gereffi (1994; 1995; 1999) was the most influential scholar in the distinction of two groups of lead firms, namely producers (capital-intensive manufacturing firms; ownership of suppliers more likely) and buyers (labour-intensive sectors; arm's-length relations more likely) with either of the two generally driving the activities in a value chain. Building on further research findings and criticism regarding the classification of lead firms (see e.g. Gibbon et al. (2008) and Sturgeon (2007) for reviews), Gereffi et al. (2005) developed a dynamic and more generic model of governance based on a range of forms of coordination and three deterministic variables (complexity of transactions, the ability to codify transactions, and capabilities of suppliers).

The GVC framework thus provides methods to study the coordination of firm-to-firm relationships and

to thus derive at explanations for the observed descriptive spatial division of labour. Yet, the units of analysis of this thesis are final markets (i.e. China as opposed to Gabon's traditional tropical timber importer Europe) and the domestic value chain in Gabon, where only the latter is studied to a firm-level degree. A proposition by Ponte and Gibbon (2005) offers an alternative method of analysis. The authors suggest that chain 'coordination' should be distinguished from chain 'governance'. The former "characterise[s] the immediate coordination of linkages between specific segments of the chain" (as cited in Sturgeon, 2007, p. 19), whereas the latter "is the process of organizing activities with the purpose of achieving a certain functional division of labour along the chain". The authors continue, "Governance is about defining the terms of chain membership, incorporating/excluding other actors accordingly and allocating to them value-adding activities that lead agents do not wish to perform. 'Rules and conditions of participation' are the key operational mechanisms of governance" (p. 3).

The 'rules and conditions of participation' are frequently expressed through rules, grading systems and standards, discussed in detail in the subsequent sub-section (Section 2.2.2). With respect to the application of the GVC framework as a research method for this thesis, the above-mentioned definition of governance thus enables us to discuss and identify Chinese-induced changes in chain governance through a discussion of standards. It is proposed to identify 1<sup>st</sup>-tier downstream foreign buyers (of Gabonese products), who are assumed to represent the European and Chinese market respectively, and the major parameters they set in order to compare differences between traditional markets and the emerging economy China. Furthermore, as governance determines the global division of labour changes here could also be reflected in concentration of activities within Gabon's tropical timber chain.

### **2.2.2 STANDARDS AND EXTERNAL GOVERNANCE**

The concept of inter-firm/chain governance is intricately linked to the discussion of standards and market access. For example, Humphrey and Schmitz explain, "chain governance means that some enterprises set and/or enforce the parameters under which others in the chain operate (2008, p. 261). The ability to codify even complex information enabled the outsourcing of parts of the production to distinct locations as it allows the standard setting lead firm to reduce the information-related transaction costs. Furthermore, researchers identified the need for firm-standard formulation as part of companies' product differentiation and risk control strategies such as intra-chain quality assurance and brand reputation (e.g. Humphrey & Schmitz, 2008; Nadvi, 2008).



In short, standards are crucial for the operation of the firms; and lead firms are thus performance standard setters to suppliers. Put differently, they “have the agency (within limits) to choose and replace suppliers” (Frederick & Gereffi, 2009, p. 1). Lead firms control the access of suppliers to foreign markets as they set entry barriers (to protect their core activities), through their control (to various degrees) over supplier activities and through the need for suppliers to work according to firm-specific standards (Ponte & Gibbon, 2005). The existence of governance determines not only the individual activities of suppliers but hence also the functional division of labour along the chain.

Yet, lead firms are convention takers as they operate in an environment increasingly dominated by global standards defined by actors external to the chain, which determines and provides the institutional framework in which firms operate. As Sturgeon (2007, p. 25) elaborates, institutions have power “by setting the rules that firms operate within” and citing from Stinchcombe (1977), “institutions ... [shape] the creation and function of units in market and relations between them”. Similar statements were made by North (1990) and Meyer and Rowan (1977) concluding that “firms and industries adapt in response to institutional pressure” (as cited in Sturgeon, 2007, p. 3). As mentioned above, these rules are codified in legal cannons and standards.

Such standards can range from voluntary agreements to legally mandatory rules, which are defined by a number of private and public agencies such as governments, international and non-governmental organisations, as well as industry bodies (e.g. the International Standards Organisation). Traditionally, public sector national standards defined interfaces and compatibility, minimum quality traits, as well as product descriptions (Angel et al., 2007). Beginning in the 1970s national regulations were challenged by increasing concerns about the social and ecological impact of globalised systems of production and trade, accordingly requiring an international dimension of standards (e.g. harmonisation of standards) and a wider range of standards now also covering processing methods<sup>28</sup> (Gereffi & Mayer, 2006; Nadvi, 2008; Ponte & Gibbon, 2005).

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<sup>28</sup> See for example Kaplinsky (2010) for a discussion on the interaction between product and process standards in general, and Chapter 4 and 6 of this thesis for the specific case of tropical timber. Note that the incorporation of non-firm standards, i.e. those set by governments, civil society and industry bodies was not part of the initial GVC work by Gereffi (see e.g. Sturgeon, 2007) but is integral to complementarily research strands such as Global Commodity Chain research (Fold, 2002; Gibbon, 2003, Gibbon & Ponte, 2005) focusing on especially institutional standards in agro-based sectors, and the utilisation of labour, specifically in labour-intensive sectors like apparel (Barrientos et al., 2003; Barrientos and Kritzinger, 2004).

As Nadvi (2008, p. 324) summarises the various governance systems, "Globalization has resulted in an extensive distribution of global production, which requires more intensive organization of ties within global production networks ('industrial' governance, 'inter-firm' governance or 'value chain' governance). It has also been associated with the relative decline of national regulatory governance, and the growing significance of both international and private actors in the arenas associated with 'market' and 'institutional and political' governance". The existence of external governance and standards defined in these spaces directly affect firm activities. For example, national regulatory pressures may induce firms to adopt standards such as company codes of conduct (Nadvi, 2008), or may define companies' activities with respect to product quality and/or other technical characteristics (Bolwig et al., 2008; Iizuka et al., 2009).

Similarly, private standard initiatives (often headed by non-governmental organisations) are a new form of regulation to minimise risks in the form of voluntary agreements and codes of conduct (e.g. Tallontire, 2007). Nadvi and Wältring (2002, 2004) further argue that such global standards not only exert pressure on firms to comply with civic notions about their activities, but also that compliance requires these externally set standards to be legitimatised. This is increasingly achieved by participation in networks comprised of members of external governance agencies and private industry. In other words, "firms seeking global acceptance ... see compliance with internationally well accepted standards inevitable to bypass unnecessary auditing from business partners and potential buyers" (Iizuka et al., 2009).

For this thesis, it is assumed that consumer notions, domestic regulations in the importing country and external global standards are to a large degree incorporated in key buyers' purchasing decisions. An analysis of the standards applied by 1st-tier downstream foreign buyers in aggregate hence reflect differences between markets<sup>29</sup>. Additionally, standards regulate the access to markets and thus can be used to draw conclusions with respect to the prevailing chain governance. However, it is important to also consider variables that are not captured by any firm-specific and global standards, but which nevertheless influence producers' relationships to their buyers. To be more precise, Gibbon (2008) concluded that factors such the political and economic history of value chain actors may influence

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<sup>29</sup> The distinction of sub-chains originating in one country (in our case Gabon) yet continuing towards distinct markets can be found in work by Gibbon (2008) and Pietillä (2008), although the former distinguish between markets in the North, whereas the main focus of this thesis is the distinction between a Northern market (Europe) and the emerging market of China with significantly different 'economic' characteristics.

industry governance. Lastly, the analysis needs to discuss suppliers' ability to comply with standards set by both or either the European or Chinese markets (through buyers). This is because at given market access criteria producers' performances thus determine their inclusion and position in the value chain<sup>30</sup>.

### **2.2.3 INCOME DISTRIBUTION AND ECONOMIC RENTS**

At the core of development economics is the concern about sustained economic growth and the distribution of the generated wealth. In the GVC literature, income distribution usually refers to the value-added accruing to individual firms or actors at each node within a given value chain. For example, Wood (2001) defines value added according to input-output tables, i.e. as the value of sales minus cost of materials. This method (of functional input-output tables) was applied by Petkova (2006) as well as by Fitter and Kaplinsky (2001) in their studies of the coffee value chain. Fitter and Kaplinsky's study revealed that only 37% of the final retail value is generated in the producer country. Petkova demonstrated that the participation in Fair Trade schemes increases the grower's share significantly. Studying the same value chain, Talbot (1997) analysed both the income (value-added share of producer and consumer countries) and surplus (export price less production and processing costs) distributions over time.

All these studies came to similar conclusions, namely that incomes (profits) which accrue to producers especially in agricultural commodity sectors are generally low despite an active participation in international production and trade. To be more precise, Talbot (1997) states that the surplus is critically dependent on the generation and control of strategic rents. Petkova (2006) concludes that the introduction of price premiums and a controlled distribution of income have temporarily resulted in retail rents appropriated by farmers, yet which can be expected to disappear in an expanding Fair Trade market (fallacy of composition). Fitter and Kaplinsky (2001) generalise their findings as the need for producers to de-commodify their activities by moving into areas of production with barriers to entry (protecting them from competition and falling terms of trade) and thus that allow them to appropriate rents.

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<sup>30</sup> Previous works differentiating between buyers (across countries) include, amongst others, that of Bazan and Navas-Alemán (2003) and Schmitz and Knorringa (2000).

In general, the studies discussed above (and those of others, notably by Dolan and Humphrey (2000)) conclude that the increasing production and organisation of trade in GVCs allows key actors to control both the value-adding functions and rent appropriation possibilities to their advantage. In other words, lead firms largely coordinate the structure of production and thus the function of individual producers and suppliers. Given that income is defined as the value-added at each node of the respective value chain, lead firms have the power to influence the intra-chain income distribution. With respect to this thesis, it is thus essential to measure the (functional) income distribution first and to relate this information to knowledge derived from the analysis of the structure of the domestic tropical timber chain in Gabon as well as the industry-governance system. Still, for an interpretation of profit earnings it is also necessary to have an understanding of the theory of economic rents.

The theoretical underpinnings of rent payments (income of factors of production with diminishing returns) were fully developed in the early 19th century by Anderson (1777) and Malthus (1815). Ricardo (1815) propelled the earliest theories on land rent a significant step further by realizing that the existence of entry barriers (to a scarce resource), next to inelastic supply of a resource, significantly altered previous analyses. Ricardo thus introduced the term economic rent as “the payment for the 'uses' of the original and indestructible powers of the soil” (Alchian, 1987). In the following decades, Ricardo's agricultural based theory was further developed as to include other resources (Clark, 1891; Marshall, 1893; Mill, 1848<sup>31</sup>). Still, the theory of economic rents remained largely a static concept, where entry barriers were treated as given and fixed.

A sophisticated dynamic economic rent theory first emerged when Schumpeter (1961) introduced his concept of entrepreneurial rents. Schumpeter regarded entrepreneurs as the motor of growth due to their ability to innovate, i.e. to turn inventions into innovative products or processes that could either be sold at a price premium or that could significantly reduce a firm's marginal costs relative to the industry's aggregate. Rents would be eroded by competition over time and thus the search for new rent appropriating sources would start another cycle of innovation and erosion. Today, rents can be appropriated in many different areas by those firms (or any other profit-oriented unit) that manage to create entry barriers or to take advantage of existing entry barriers (see Kaplinsky, 1998; 2005). One type of rent is based on a bounty of nature, access rights, and the commodity price market (Ricardian

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<sup>31</sup> Also discussed in, e.g. van den Berg (2000), Fetter (1977), Kaplinsky (1998), Kurz (n.d., 2001) and Lackmann (1976).

rents), while the second type is created by strategic actions of firms and is likely to be eroded by competition over time (Schumpeterian rents).

## **2.3 CHAPTER SUMMARY**

The first section of this chapter demonstrated that economic growth is largely a function of capital accumulation specifically in manufacturing industries (and at early stages of economic development labour-intensive sectors). Contrastingly, primary-export-led growth strategies have usually failed to translate to sustained growth because of these countries' deteriorating terms of trade, the real price movements of commodities and commodity price volatility. Additionally, the management of price shocks strongly depends on the ability of governments to mitigate Dutch Disease effects. The state in general has an influential role in the re-investments of resource-derived foreign exchange into the expansion of manufacturing industries and factor accumulation (or as is argued into an expansion of resource-based industrialisation given human capital, technology and further diversification).

Furthermore, gains from industrialisation, in particular outward-orientated industries and thus trade participation, are dependent on the division of labour. On a global scale, participants' production/processing activities are thus a function of comparative advantage (which in turn is a function of factors of production) and increasingly by their integration in global systems of production. Yet, as was shown in the second section of this chapter, global value chains are governed by lead firms who have the power (within limits) to exclude actors, to define access criteria through standards (incorporating external chain standards), and to thus define the income distribution along the chain. The often implicit assumption of most studies applying the GVC framework is that final markets are located in OECD countries.

This assumption is challenged if final markets shift from the OECD towards the emerging economies, at this point particularly towards China, which is at a resource-intensive stage of growth and whose population is characterised by consumer needs different to those in traditional markets due to current per capita incomes. In more detail, the type of chain governance defined over buyer-, state-, and civil society standards may vary because of differences in final markets. This could simultaneously mean that standards guarding market access differ. Furthermore, the shift in final markets may entail variations in the functional division of labour and thus the intra-chain income distribution.

Additionally, it is also possible that changes in the utilisation of domestic factors of production emerge as Gabon's industry reacts to the changes in the international division of labour and the new structure of comparative advantage (now aligned to its new trading partner China). For this reason the GVC-guided analysis in this thesis is complemented by a simulation exercise to show how the participation in various value chain activities may result in an intensification of factor usages, and hence possibly resource transfers across the given nodes of production in Gabon. This exercise is linked to the theoretical parts of this thesis as it assumed that there are two factors of production, namely capital and labour.

Lastly, also breaking with traditional patterns, China has become both a location for foreign direct investment from the North and also a source of foreign direct investments for low-income countries (see Chapter 1). Investments by Chinese industries in Africa are predominantly directed towards extractive industries of strategic interest to the Chinese economy, such as tropical timber. These investments are often linked to aid and trade as summarised by the so-called Angola-model (see footnote 11 in Chapter 1). Moreover, the influx of Chinese capital has received attention not only because of the combination of the three vectors aid-trade-FDI but also because of its environmental footprint and socio-economic consequences. It is therefore an imperative to also pay attention to the impact of the integration of Chinese producers in Gabon's tropical timber industry.



## **CHAPTER 3 RESEARCH METHODOLOGY**

This dissertation is anchored in the disruptive impact of China's resource-based economic expansion over the last two decades. Whilst the country's economic growth follows traditional patterns of development, the size of China's population challenges the small-country assumption inherent in many macroeconomic trade models. The recent commodity boom, the redirection of commodity trade flows and the seeming reversal of commodity exporting countries' terms of trade are a result of China's non-marginal impact of consumption. This thesis uses examples from the tropical timber industry in general and primary data from Gabon in particular to examine the impact of China's consumption of tropical timber forest products on Gabon's domestic tropical forestry industry.

More specifically, the research hypothesis states that given the organisation of production and trade in global value chains coordinated by dominant chain actors, a redirection of trade away from traditional buyers in the North towards the emerging economy of China will lead to transformations in the organisation and governance of increasingly Sino-driven global value chains originating in the South, and that these changes are likely to be disruptive in nature. Furthermore, the growing presence of Chinese producers in Gabon, a Southern resource industry, has the potential to accentuate structural changes in the organisation of production.

The previous chapter (Chapter 2) outlined the theoretical base that described the role of natural resources in economic growth and development, as well as the analytical framework to answer the research questions on 1) the shift in physical timber trade flows, 2) the differences between the two final markets China and the North, 3) the distinction of producers in Gabon by nationality, specifically Chinese companies versus established European/Gabonese companies, as well as the determinant of producers' value chain participation, i.e. final markets or ownership of production, 4) the effects on the functional division of labour and industry governance, and 5) the growth and developmental impacts arising from these changes.

### **CHAPTER OUTLINE**

The thesis is informed by desk-based research and fieldwork. The following methodologies were used to retrieve and analyse both qualitative and quantitative data: i) literature review, ii) secondary data



analysis and iii) primary data analysis, where data were retrieved through iii.i) interviews and discussions, as well as iii.ii) a questionnaire. Each of these methodologies is introduced in more detail in the subsequent sections. Emphasis is placed on the fieldwork data collection process through interviews, the estimated sample size and the sample distribution across producers qua nationality, as well as the design of the questionnaire.

### **3.1 LITERATURE REVIEW**

A literature review was used to collect information and other background material for the discussion of the thesis' research questions. In particular, Chapter 1 (disruptive impact of China), Chapter 2 (theory and analytical framework), Chapter 4 (global forestry industry, Chinese and Northern consumption patterns, global governance system) and Chapter 5 (Gabon's domestic economy and forestry industry) have a macro perspective as these chapters introduce and provide an overview of the respective subjects in each chapter.

The introductory and theoretical chapter (including the introduction of the analytical framework) make exclusive use of research results and theoretical contributions published in journal articles, conference papers, reports and books (or selected book chapters). Most of this material, especially articles, papers and reports, are now accessible through online collections, accessed through the Open University library website, such as JSTOR (Journal STORage), EBSCO Host, Informaworld and ScienceDirect. Articles and books published in hardcopy were accessed through the Open University library facilities on campus. Working papers published by international organisations like the World Bank, the International Monetary Fund (IMF), the United Nations Conference on Trade and Development (UNCTAD) and the United Nations Economic Commission for Africa (UNECA) were retrieved from organisations' websites and online archives.

The overview of the global, Chinese, Northern and Gabonese forestry industries alike are further based on information retrieved from reports published by specialised organisations. Specialised agencies include, among others, the Forestry department of the Food and Agricultural Organization of the United Nations (FAO), the Forestry and Timber Section of the United Nations Economic Commission for Europe (UNECE), the International Tropical Timber Organization (ITTO) based in Japan, the Congo Basin Forest Partnership (a voluntary multi-stakeholder initiative, [www.cbfp.org](http://www.cbfp.org)) and the illegal-

logging.info website managed by the Royal Institute of International Affairs (Chatham House, UK). Non-governmental organisations like Forest Trends, Greenpeace, Forests Monitor and the World Wide Fund for Nature (WWF) publish reports linked to tropical timber and the tropical forestry industry, too, which were regularly consulted and accessed through each organisation's respective website.

### **3.2 SECONDARY DATA ANALYSIS**

Quantitative secondary data were crucial for the discussion and analyses introduced in Chapter 1 (specifically economic and trade related data for China and Africa), Chapter 4 (global production and trade), Chapter 5 (Gabon's economic profile, as well as the production profile of the domestic forestry industry) and parts of Chapter 8 (simulation exercise). For this reason, empirical data were collected from the following sources and/or retrieved from the below-mentioned online databases.

Empirical data were extracted from documents listed in the previous section, i.e. publications of international organisations, specialised organisations and academic institutions (Section 3.1). Macroeconomic and trade data were also collected from databases provided by the various United Nations organisations like the World Bank (World Development Indicators, African Development Indicators), the IMF (World Economic Outlook, Primary Commodity Prices, International Financial Statistics), UNCTAD (Handbook of Statistics, Commodity Price Statistics), and the United Nations Statistics Division, specifically from the commodity trade database UN Comtrade. Trade and production data focusing on forest products are provided by the FAO (ForesSTAT and Forestry Trade Flows), ITTO (Annual Reviews) and the European Forest Institute (EFI, Forest Products Trade Flow Database).

Especially with respect to production and trade data of timber and wood products, irregularities between databases and reporting gaps exist<sup>32</sup>. The ITTO Annual Review data are published in cubic metres and US dollars (based on Comtrade and FAO data, as well as staff estimates). Reported data are limited to member countries and cover only a limited period of time. For example, quantities and values of secondary processed wood product trade data are only included in the Annual Review published in 2008. Furthermore, trade flow data are restricted to major importer/exporter countries in

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<sup>32</sup> Often the reported quantities of one country do not match the ones of the respective trade partner. This holds true across databases and is by some considered to be a sign of illegal trade of forest products (see e.g. Castaño, n.d.; Johnson, 2002; Vincent, 2004). When necessary any irregularities are pointed out throughout the chapter.

each particular year. Price data are presented graphically while numerical values are not stated. The United Nations Commodity Trade Statistics Database (Comtrade) reports quantities and values of traded forest products. However, quantities are reported in kilograms. Extracted datasets may contain major reporting gaps (especially regarding the trade volume). Production data are by definition not included in this database.

The EFI database was occasionally consulted; reports here are based on UN Comtrade data though quantities are converted into cubic metres. This database does not provide production data. The FAO databases were used intensively for retrieval of both trade and production data (reported in cubic metres and US dollars). Trade data were also retrieved from Chinese Customs via the website [www.globaltimber.org](http://www.globaltimber.org), which is updated monthly and reports units in cubic metres. Note that existing international classification systems like SITC (Standard International Trade Classification) and HS (Harmonised System Codes) only differentiate between tropical and non-tropical timber in some product categories such as logs (SITC Revision 3, 247.51), sawnwood (SITC Revision 3, 248.4), veneer (SITC Revision 3, 634.12) and plywood (SITC Revision 3, 634.31) but not for secondary processed wood products like wood furniture.

Quantitative data were further retrieved from documents collected during fieldwork in Gabon such as export data and log prices, as well as complementary industry statistics. The main sources<sup>33</sup> were the Société d'Exploitation des Parcs à Bois du Gabon (SEPBG), the Société Nationale des Bois du Gabon (SNBG), and documents prepared on behalf of the French Embassy in Gabon. The Ministry of Forestry (Ministère de l'Economie Forestière, des Eaux, de la Pêche et de l'Aquaculture) and the Ministry of Commerce and Industrial Development were repeatedly contacted. Although interviews were conducted with representatives of the Ministry of Forestry, quantitative data were not shared with the author. Online access to data through official government websites (e.g. <http://www.legabon.org>) is extremely limited and existing data were often not up-to-date. As a result, most economic data and employment figures were retrieved from secondary sources (listed in Section 3.1) and/or online databases (see above) instead. Firm-level quantitative data were occasionally made accessible to the author during interviews, for instance company reports stating production volumes, capital investments

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<sup>33</sup> Access to production and trade data reported by Gabonese authorities (Ministries and other government institutions) is severely restricted.

and so forth. These documents will be destroyed upon completion of this thesis on request of the companies that made the documents available to the author.

### **3.3 PRIMARY DATA ANALYSIS**

Firm-level data obtained during fieldwork in Gabon form the core of this thesis, specifically the discussions and analyses presented in Chapter 5 (domestic governance system in Gabon; analysis of production profiles), Chapter 6 (buyers' performance criteria and standards, as well as producers' self-assessments), Chapter 7 (Gabon's tropical timber value chain and producers and processors' profiles) and Chapter 8 (intra-chain income distribution). Primary data also support the analysis of the simulation exercise performed in Chapter 8. Data were retrieved through discussions, interviews and a questionnaire.

Discussions with industry experts proved to be useful in understanding the technical details and general organisation of the forestry industry. The author corresponded with an employee of the German Ministry of Forestry and an UK-based industry consultant, both with work experiences in tropical countries, to get a general understanding of the sector. An employee of a German retailer specialised in wood products was frequently contacted for clarification of technical details. A researcher based at the Open University was contacted for information about the global governance system of the forestry industry. The author attended the 12<sup>th</sup> Illegal Logging Update conference in London (summer of 2008, organised by Chatham House), where personal contacts to research institutes and specialised organisations were established, and among whom research results were shared henceforth (including publications by the author).

The fieldwork took place in Libreville, the capital of Gabon, between November 2008 and February 2009. The majority of logging and processing companies, as well as international, regional and national organisations are based in Libreville. Given this density of potential interview partners, as well as financial plus time constraints, made Libreville the best suitable location for fieldwork. The next biggest city Port-Gentil, with a small population of logging and processing companies, can only be reached via plane or boat from Libreville (with an international airport), which were options beyond the allocated financial budget. There are only four major roads (10% of which are paved) and one train line in Gabon to reach the interior. Industry experts located in Libreville repeatedly discouraged the author from

spending time travelling to distant cities on the off chance of an interview. This is because of the danger associated with travelling and due to the frequent absence of management staff from the site. The author received two invitations to visit logging sites but these invitations were later revoked due to changing weather conditions (making the access road impassable) and time issues (the host's office was raided and his trip consequently postponed).

Even with a focus on Libreville, it was extremely difficult to identify and establish contact to private companies situated in Gabon. This is because there is no publicly available directory (e.g. from the Ministry or Chamber of Commerce). The author was thus forced to apply a non-random sampling strategy, i.e. snowball sampling based on information (the existence and location of other companies) obtained from people already interviewed<sup>34</sup>. Given these difficulties, the author also tried to identify companies in vicinity to those companies with known addresses, i.e. before and after scheduled interviews the author physically searched for other private industries. Through this method, it was possible to identify several logging companies, transport companies, traders and one producer of capital goods. International and national organisations, trade associations and embassies were identified through their respective websites. A list of potential interview partners at these organisations was obtained from a researcher at the Centre for Chinese Studies in South Africa, and was complemented by data obtained through the snowball-sampling technique mentioned above.

In total, twenty logging/processing companies were interviewed. Of these twenty companies, 16 interviews resulted in both quantitative and qualitative data that could be used for empirical data analysis sections of this thesis<sup>35</sup>. The remaining four interviews, though conducted with logging/processing companies, delivered purely qualitative data. For this reason, the information extracted from these interviews complemented the qualitative parts of the discussion but could not be utilised for quantitative data analyses. To give an example, one logging/processing company mainly produces logs and some processed wood products for its Moroccan headquarter, but it does not trade with China. A comparison between the Chinese and European markets could thus not be made by the company representative. Alternative topics, such as barriers to entry of the forestry industry and the enforcement of national legislation, were discussed during this interview instead.

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<sup>34</sup> Over time, a certain level of saturation was reached as no 'new' companies were mentioned. See main text for information on sample size.

<sup>35</sup> Note that each company (also later referred to as Gabon office) can operate subsidiaries in Gabon (see Chapter 7). Data was collected on a subsidiary-level whenever possible. The total number of subsidiaries, i.e. the combined number of subsidiaries of all 16 companies, is 16.

Until today, the population size can only be estimated or is simply not known, as there is no complete, accessible database about the population of timber producing (and processing) firms in Gabon. However, it is possible to make an informed judgement about the representativeness of interviews with logging/processing companies. For example, the most up-to-date list of concession holders published by the World Resources Institute (WRI) in cooperation with the Ministry of Forestry (referred to as Gabon Forestry Atlas in Chapter 7; Authors: Makak and Mertens, 2009, p. 29) lists companies whose combined concession area in Gabon equals 10,192,337 hectares. In comparison, the aggregate concession area size of the 16 interviewed companies is equal to 5,468,330 hectares, and that of those including the companies with exclusively qualitative data is 6,280,612 hectares. These numbers, i.e. shares of concessions, translate to a sample size of roughly 54% and 61% respectively.

Using a different dataset, namely export statistics for the year 2008 disaggregated to companies (obtained from SEPBG during fieldwork; SEPBG, 2009), also allows calculating the sample size. The total log export volume in 2008 for all companies was 1,650,085 cubic metres. Companies covered during fieldwork exported 1,078,700 cubic metres (16 interviewed companies) or 1,226,943 (18 companies, 2 not listed), which are sample size shares of approximately 65% and 74% accordingly. Lastly, the Ministry of Finance published a list of all concession holders in 2007. The approximate concession area size is equal to 10,240,258 hectares<sup>36</sup>. According to these data, the sample sizes are around 48% (16 companies, 4,934,130 hectares) or 56% (20 companies, 5,703,435 hectares). Taken all results into account, the estimated sample size of logging/processing companies interviewed during fieldwork lies roughly between 50% and 70%.

One of the topics discussed in this thesis is the impact Chinese logging companies might have on the structure of production in Gabon. Regarding the 16 companies which were interviewed and where both quantitative and qualitative data are available, four are owned by French nationals (7), three are Chinese (9), two Malaysian (8), four Gabonese (5), and two from other nationalities (2). The numbers stated in brackets are the total number of companies and their subsidiaries per group. Based on company data listed in the Gabon Forestry Atlas (which states the nationality of each company, company names and concession area sizes), the sample per group of nationality based on

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<sup>36</sup> This is the approximate area size of all companies (not individuals, see below) in the concession holder list corrected for double-entries.

concessions covered 30% of all French companies, 60% of all Chinese ones, 90% of all Malaysian, and 75% of all Gabonese-owned companies.

It should be noted that individual concession holders (including politicians and ministers, around one million hectares of combined concession area) were not interviewed, as they are often not directly involved in the management and extraction of timber from their concession areas (see also Chapter 7). The exploitation rights are often passed on to private companies, which were contacted for interviews instead. Information about the position and function of this group of individuals was also collected during interviews in Gabon with other actors. For instance, two traders were interviewed that buy tropical logs from such individual concession holders. In addition, the author interviewed staff of an EU-financed project directly targeted at small-to-medium sized companies in Gabon.

Next to logging/processing companies and traders, three transport companies and three capital good providers were interviewed. Furthermore, the author spoke to six international organisations like the World Bank, the World Wide Fund for Nature and the Tropical Forest Trust. A representative of the only existing logging company association was interviewed, too, as well as the only provider of specialised education, i.e. an employee of the National School for Waters and Forestry. The French and Chinese embassies, plus the Chinese Centre of Commerce were visited also. Lastly, there are two consulting companies in Gabon that advice logging/processing companies, e.g. in sustainable forest management, both of which were interviewed by the author. For many groups of industry actors, such as suppliers of capital goods, information about the population size does not exist. This holds true for the transport sector, traders and service providers (accountants, insurance companies, etc). Based on interview information, in some sectors only of a handful of companies exist, e.g. there are only two producers of train sleepers and two producers of saw blades. This means that a single interview would count as a sample size of 50%. The author interpreted the small population of some complementary sectors as a sign for the absence of domestic linkages (see Chapter 7).

Semi-structured, open-end interviews were conducted with a diverse group of interview partners (see above). The structure of interviews was drafted prior to departure but revised at an early stage of fieldwork to take into account new information. The topics discussed during interviews with private logging and processing companies were about the company profile, production profile, product flows,

downstream buyers, upstream suppliers, profit/value-added profile and the forestry industry of Gabon. The interview structure with input and service providers as well as traders was adjusted when necessary. Topics discussed with staff from (inter)national organisations and domestic institutions (including the Ministry of Forestry) covered issues such industry employment figures, the domestic governance system, Chinese companies in Gabon, industry barriers to entry and so forth.

The information obtained during interviews can be broadly categorised into four types, i.e. qualitative data, quantitative data, observations and 'secondary' data about other companies, in particular Chinese and Malaysian-owned ones (Chapter 7). All data were initially transferred from notes to electronic form for each respondent during fieldwork. The data was later merged and coded; quantitative data were analysed using Excel. Qualitative data (primary and secondary) were triangulated across groups of interview partners next to information available in the public domain<sup>37</sup>. The opinions of individual interview partners were summarised and expressed in the author's own words, or, as was done frequently in Chapter 6 and 7, were reproduced as quotes. For privacy reasons the source of each quote is in most cases not stated, although, when appropriate for the discussion, references are given with respect to the 'type' of respondent (e.g. logging company, NGO, etc).

Data were collected for roughly three points in time 2002 ('past'), 2007 ('today'<sup>38</sup>), and 2013 ('future scenario') to allow for an assessment of changes over time (disaggregated to factors that caused these changes). In many cases, the obtained data are however restricted to the year 2007, thus making it difficult to judge recent and/or future developments based on quantitative data. As a result, the analysis is predominantly a snapshot of activities in 2007. Interviews lasted between 30 minutes and three hours depending on the availability of the interview partner. Notes were taken during the interview and completed immediately after the interview. The interviews were conducted in French, English, Dutch and/or German, facilitated by a translator<sup>39</sup>. When requested, each respondent received information about the author and the thesis topic prior to the interview. A thank-you letter, along with the request

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<sup>37</sup> For example, information about Chinese actors in Gabon stated by other private companies could have been biased due to competition. Thus it was checked whether similar company names and similar descriptions were also given by non-industry actors (e.g. non-governmental organisations) and/or other researchers in their publications.

<sup>38</sup> Note that although the fieldwork took place from November 2008 until February 2009, interviewees were asked to state information about the year 2007 so that the harsh impacts of the global recession were largely excluded from the analysis as this is not the central theme of this thesis.

<sup>39</sup> The author (whose native tongue is German, and with knowledge of both English and French) has worked with translators before and was thus accustomed to this type of interview. In general, interviewees responded positively to the translator and seemed not to be distracted. Note that interviews were not recorded to avoid giving the impression of being a journalist as the industry has been heavily criticised in the past by the media and the non-governmental sector.



for the clarification of parts of the interview and the questionnaire (see below) were sent to the respondents following the interview. The interview partners were informed that the provided information would be presented in an anonymous way unless they agree to be explicitly mentioned as a source.

A questionnaire was drafted prior to departure to collect quantitative data on buyers' performance criteria and their application of international standards. To be more precise, this thesis compares standards set by the Chinese market to producers in Gabon with those set by Gabon's traditional export partners in Europe (see Chapters 2 and 6). The importance of selected standards within each group and across European and Chinese markets can be easily compared using scored responses (Likert-scale), here on a scale from one to five. This methodology is suggested in the 'Global Value Chain Handbook' (Kaplinsky & Morris, 2002), and has been used in numerous global value chain studies comparing groups of industry actors (e.g. Bazan and Navas-Alemán (2003) and Schmitz and Knorringa (2000)).

Response triangulation, as suggested in the GVC Handbook, where the same questions are asked to both the supplier and the buyer of specific products, could not be undertaken due to financial and time constraints with the data collection focusing exclusively on Gabon. Still, buyers were asked to rate their performance against the requirements of foreign buyers. Differences between foreign buyer requirements and producers' performances exist (Chapter 6), thus providing confidence that a representative judgement was made by the respondents both about their capabilities and the importance of standards set by their buyers.

The selection of standards was based on information retrieved from reports published by specialised agencies, e.g. documents on developing countries' producers' impediments to market access and global value chain studies; the selection process was further informed by the standard setting agency (see Chapter 2). Firm-specific performance criteria selected for the questionnaire were largely retrieved from value chain studies (see above), focusing on generic variables such as the importance of price, volume and quality. Industry specific criteria were added such as the importance of the variety of tree species and environmental compliance.

Standards set by agents other than private industry are often classified as non-tariff barriers to trade

(NTBs). With respect to NTBs prevalent in the tropical timber industry, these were extracted from reports produced on behalf of specialised agencies, e.g. 'How to hurdle the barriers to trade' (Taylor et al., 2005b) and 'Market Access of Tropical Timber' (Rytönen, 2003). Furthermore, the author requested the report 'Measures to promote the expansion and diversification of international trade in tropical timber' (Taylor et al., 2005a) from the ITTO, which included a questionnaire on producers' perceived impediments to market access. Based on these three reports and the knowledge about the types of products that Gabon exports (logs and primary processed wood products), both technical regulations and global civil society standards were selected for inclusion in the questionnaire, used for data collection for this thesis.

The questionnaire was also designed to obtain data from logging/processing companies that enable the author to produce input-output tables for the measurement of value-added and profit margins. Yet, it quickly became clear that profit, production cost and product price data are sensitive information usually not shared with third parties. Consequently, this part of the questionnaire had to be re-designed whilst in the field. An index system was used instead of prices, from which an index value-added distribution along the chain can be derived. It was thus possible to construct an indexed input-output table.

In a few cases, the length of the interview was sufficient to request the respondents' opinion about questions in the questionnaire during the interview. In most cases, the author deposited or forwarded the questionnaire to logging and processing companies that had already been interviewed. This allowed the author to allocate more time during the interview to other topics, but required the author to repeatedly contact interview partners to ensure a collection of questionnaires (e.g. via e-mail) even in the period following the fieldwork. One questionnaire could not be retrieved. The analysis of the qualitative data based on the questionnaire was always complemented with quantitative data retrieved during interviews (except for the indexed input-output table). It is our opinion that the combination of quantitative and qualitative data gives a significant and accurate summary of events.



## CHAPTER 4 THE GLOBAL TROPICAL FORESTRY INDUSTRY AND PATTERNS OF CONSUMPTION

When asked about their thoughts on tropical forests the majority of people in Europe will probably recall images of impenetrable rain forests like the Amazon Basin covering large areas of South America. Further associations might be made of indigenous people who live in harmony with their natural environment, of abundant flora, of exquisite insects and of exotic mammals. While these images of lush wildlife and biodiversity still feature in broadcasted nature programmes one could also see rather disturbing pictures displaying the exact opposite as of the late 1980s: bushmeat sold on rural markets, plants threatened with extinction, road construction through virgin forests, and the displacement of both forest dwellers and primates.

We were 'educated' about the apparent wrongdoings of large logging companies on foreign soil by non-governmental organisations (NGOs). These earlier campaigns carried the overarching message that the tropical forests need to be saved from eradication through the hands of so-called "chainsaw criminals" (a term often used by Greenpeace). The proposed way to stop the ongoing destructions was through the boycott of tropical timber by consumers and industry, further supported by an immediate ban on tropical timber imports in the North. Yet, calls for large-scale timber import bans are rarely heard these days as the most prominent NGOs and advocacy groups have changed their discourse over the time of their lobbying activities<sup>40</sup>. Instead, the new channel for both public and private consumers to halt the destruction of rainforests is thought to be through conscious purchase decisions of products made from sustainable timber sources.

Indeed, sustainable forest management (SFM) seems to be the new buzzword across the board of NGOs, international organisations, forestry professionals and donor agencies alike. Criteria and indicators of SFM are being drafted and monitored to detect progress over time, next to an increasing availability of wood products, which carry the Forest Stewardship Council label<sup>41</sup>. Such certification schemes aim to signal that wood production is subject to controls in light of ecological sustainability and acceptable socio-economic conditions. However, the rate of uptake of certification among producers is concentrated in industrialised countries, accounting for between 80-90% of all certified

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<sup>40</sup> Domask (2003); Gulbrandsen and Humphreys (2006); Stringer (2006)

<sup>41</sup> Castañeda (2000); FSC (n.d.-b); Hickey et al. (2007); ITTO (2005b)

forest areas. Contrastingly, only about one percent of forest areas are certified in each Africa, Asia and South America (UNECE/FAO, 2009).

At the same time as it is difficult to escape abiding news about sustainable resource usage, now often embedded in climate change and carbon footprint discussions, we have become used to the convenience and price competitiveness of flat-pack products. Still, one might wonder about the exact provenance of many of these cheap wood products and the raw material they are made of, given that tropical forest areas continue to decrease both in size and in quality. Debates about deforestation, climate change, sustainability, and (the absence of) resource transfers between the North to the South are now openly taking place in most countries of the OECD. Still, these topics might be of lesser priority in China, which is an emerging economy in the South at an earlier stage of industrialisation and with lower per capita incomes.

## **CHAPTER OUTLINE**

The first section introduces the top global producers of tropical timber and wood products, as well as the main drivers of supply and demand. Intricately connected to production profiles are the topics of deforestation and illegality, which are thus discussed as well. The section continues with an analysis of trade of logs and wood products, specifically the shift in log trade flows due to the non-marginal impact of consumption of Chinese wood processing industries. Using the global tropical timber industry as an example, differences in the pattern of consumption between China and the North (here often exemplified through the EU) are subsequently highlighted. The second section provides details on China's import structure, its domestic processing industries, and its non-sustainable rate of tropical log procurement. The third section focuses on the changing pattern of wood usage in Europe that, inter alia, have led to current demand patterns for timber and other forest products, as well as to the formulation of current forest management practices. Production and international trade are increasingly bound and influenced by the global forestry governance system, which is outlined in the fourth section.

### **4.1 SOUTHERN PRODUCERS AND GLOBAL TRADE FLOWS**

Tropical forests only exist between the northern and southern tropic and at elevations below 1,000 metres (WWF, n.d.-b), thus restricting tropical wood production to a limited number of countries. Tropical forest reserves have been diminishing rapidly for the past centuries (Houghton, 1994; Spray &

Moran, 2006). According to data published by the Food and Agricultural Organization of the United Nations (FAO), around 13 million hectares of forests were lost per year over the period 2000-2010, which is equivalent to around 0.5% of the total world forest area annually. Of the total area, four and slightly more than three million hectares are deforested in South America and Africa respectively each year (FAO, 2010; Hansen et al. 2010).

Large areas of tropical forests are cleared through human activity for land conversion (agriculture, population encroachment) and infrastructure (extension of road networks), as well as due to logging activities (Angelsen & Kaimowitz, 1999; Barbier & Burgess, 2001; van Kooten et al., 1999; Rudel et al., 2009). The underlying determinants of deforestation vary from one region to another and to this date, despite a vast number of studies<sup>42</sup>, a dominant global pattern cannot be established (Geist & Lambin, 2002; Scricciu, 2007). The depletion of forest stocks is a serious restraint to tropical timber supplies and can lead to the exhaustion of an otherwise renewable resource. For example, Thailand and the Philippines have already lost the majority of their natural forests, while Papua New Guinea and Indonesia are predicted to follow suit in about 13-16 years and ten years accordingly (White et al., 2006).

#### **4.1.1 TROPICAL LOG PRODUCTION BY THE TROPICAL SOUTH**

Around 70% of the global log production takes place in the North (Table 4-1), chiefly in the USA (21%), Canada (12%) and Russia (9%). In comparison, the developing country producers in aggregate, headed by Brazil (6%) and China (6%), only have a global wood market share of nearly 30%. Focusing on countries with significant tropical forest areas, tropical log productions represent 15% of the total annual extracted quantity in 2008. The top-10 'tropical' producers' share of world production is a mere 12% compared to the nearly 60% aggregate market share of the top-10 Northern producers. Thus, although given an almost equal distribution of forest areas between the North and the South, extraction rates are historically much lower in developing countries, particularly in tropical ones.

The largest producer of tropical logs is Brazil, followed by Indonesia, Malaysia, India and Nigeria (Table 4-2), which jointly contributed to a global tropical log production volume of just over 130 million

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<sup>42</sup> Studies focusing on the establishment of a key single causation exist e.g. from Amelung and Diehl (1992), Waggoner and Ausubel (2001) and Williams (1998). Multiple-regression models were used by Cropper and Griffiths (1994), Mendelsohn (1994), as well as Rudel and Roper (1996). Multiple factor analyses were also conducted by Bhattarai and Hammig (2001), Leplay and Thoyer (2009) plus Uusivouri et al. (2002), all of whom additionally corrected their models for ecological zones and/or political systems.

cubic metres in 2008. The production of tropical logs is concentrated with slightly more than 70% of total production taking place in the top-five producer countries. Gabon is the seventh largest tropical log producer globally (and the second largest African producer). Wood production reacts to several demand factors, of which the most fundamental ones are economic growth and population levels. Other variables are end-use patterns of consumption, technology (of processing industries), as well as the price of both wood and its closest substitutes (Trømborg et al., 2000; UNCSD, 1998; Whiteman et al., 1999).

**Table 4-1** Forest area (2005) and global log production (2008)

	Forest area (1,000 ha)	Share (%*)	Total log volume (1,000 m <sup>3</sup> )	Share (%*)	Top-10 producer log volume (1,000 m <sup>3</sup> )	Share (%*)
World	3,950,000		883,070			
Industrialised	1,840,000	47	625,850	71	518,600	59
Developing	2,120,000	54	257,220	29	207,340	23
Non-tropical	2,150,000	54	750,290	85	566,800	64
Tropical**	1,800,000	46	132,780	15	110,130	12

*Sources:* Data extracted from ForesSTAT by the Food and Agricultural Organization of the United Nations (<http://faostat.fao.org>) accessed January and August 2010 and FAO (2006a, b)

*Notes:* \* Percentage share per group or top-10 producer countries' aggregated group area/volume of respective world total area/volume; \*\* Classified as tropical country when the tropical forest area exceeds the non-tropical forest area of a country, classification system based on EarthTrends by the World Resources Institute (<http://earthtrends.wri.org>) accessed November 2009; only non-coniferous wood considered for tropical countries

**Table 4-2** Top five producers of tropical logs and Gabon (2008)

	Total log volume (m <sup>3</sup> )	Share of global production (%)	Share of global 'tropical' production (%)	Forest area* (1,000 ha)
Brazil	25,834,000	2.9	19.5	477,698
Indonesia	21,602,000	2.5	16.3	88,495
Malaysia	21,009,000	2.4	15.9	20,890
India	19,695,000	2.2	14.8	67,701
Nigeria	7,100,000	0.8	5.4	11,089
Gabon	3,400,000	0.4	2.6	21,755

*Source:* Data extracted from ForesSTAT by the Food and Agricultural Organization of the United Nations (<http://faostat.fao.org>) accessed January and August 2010

*Note:* \* Forest area data (source see Table 4-1) inserted for referencing purposes

The key variables with an effect on log supplies are changes in land use, the rate of deforestation and systems of forest management. For example, Brazil's tropical log output has been increasing since the late 1990s in response to higher domestic demand from processing industries. Contrastingly, Malaysia's tropical log production declined in the early 1990s due to the ongoing implementation of sustainable forest management practices and more recently as a reaction to worsening economic

conditions. Though responding positively to rising demand from the construction industry, Indonesia's tropical log production levels have otherwise been decreasing steadily since 1996, largely due to domestic resource depletion, followed by national policies allowing a firmer action against illegal logging (ITTO, 2008, 2009a).

For many developing countries, the reported production volumes are likely to be understated because they exclude illegally exploited logs (Contreras-Hermosilla, 2002; Nilsson & Bull, 2005). In Indonesia (70-80%) and Brazil (80%), large quantities of total log production are believed to be from illegal<sup>43</sup> sources as reported by Currey et al. (2001) and the World Wide Fund for Nature (WWF, 2006) respectively. For Gabon, the rate is estimated to be around 50-70% of total production (WWF, Chapter 5 and 7). The same WWF study estimates the annual 'economic' loss to the global forestry industry due to illegal log trade to be in the region of €10-15 billion globally. Reports by the World Bank (2006, 2007) came to a similar conclusion. They estimate annual industry market losses worldwide to be in the order of around US\$10 billion, next to foregone government revenues of around US\$5 billion per year.

Due to the existence of illegally exploited logs in the international market, the aggregate global price is suppressed. Simulations by the American Forest and Paper Association (2004) suggest that on average the world price is reduced by seven to sixteen percent. Yet, results by Li et al. (2008) derive at an increase of world prices of between two to four percent, if illegal logging were to be eliminated<sup>44</sup>. To illustrate, a field report published by the Environmental Investigation Agency (EIA, 2005a) documented a doubling of Merbau log prices after the seizure of 400,000 cubic metres of illegally exploited logs (from Indonesia bound for China), which is equivalent to roughly five percent of the combined global annual trade volume of all tropical log species in the year 2008. The low global price level due to illegal logging oppresses the profitability of forestry industries, thus undermining investments in sustainable forest management systems and other factors of production (Brack, 2005; J. Hewitt, pers. comm., March 2010).

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<sup>43</sup> A universally accepted definition of illegal logging does not exist. Smith (2002) defines illegal logging as "timber harvesting-related activities that are inconsistent with national (or sub-national) laws", while Fern (2002) as well as Brack and Hayman (2001) further specify that "the harvesting procedure itself may be illegal, including corrupt means to gain access to forests, extraction without permission or from a protected area, cutting of protected species or extraction of timber in excess of agreed limits" (all as cited in Guertin, 2003, p. 3).

<sup>44</sup> Li et al. ascribe differences in simulation results to the definition of variables, i.e. whereas in their study shifts in timber supply are predicted endogenously the study on behalf of the American Forest and Paper Association assumed an exogenous supply shift.



Even with the inclusion of illegally exploited logs, overall production volumes in tropical producer countries remain relatively low given the respective forested area and potential (sustainable) rate of extraction. This 'underperformance' can be explained by the traditionally low rates of utilisation of available species and the inaccessibility of large areas of natural forests (Sohngen et al., 1997; Wunder, 2003). Economies of scale or other means of achieving higher processing efficiencies are often absent, too. In fact, studies have shown that it is difficult to achieve economic competitiveness jointly with sustainable forest management, rather than conventional harvesting practices (Pearce et al., 2002, 2005; Rice et al., 1997; Victor & Ausubel, 2000). Moreover, many developing countries have relatively weak forestry industries due to a lack of investments, infrastructure and skilled workers (Bazett, 2000; Whiteman et al., 1999). They often operate in an environment of untransparent and weak domestic governance structures, e.g. due to the prevalence of corruption and other forms of rent-seeking activities, that thus channel resources into non-productive areas (Kishor & Damania, 2007; Repetto & Gillis, 1988; Ross, 2001).

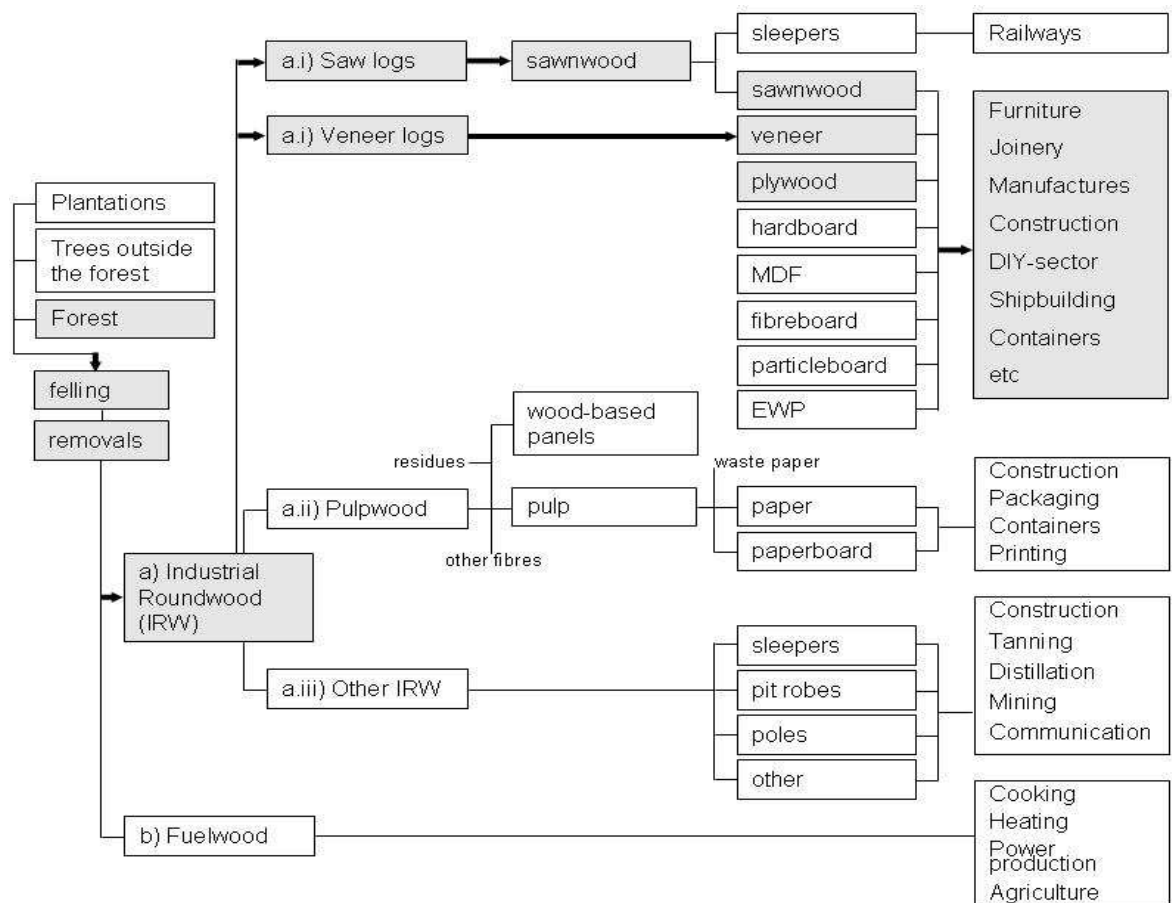
#### **4.1.2 TROPICAL WOOD PRODUCTS PRODUCTION BY THE TROPICAL SOUTH**

Wood extracted as logs are further processed in light of demands of final consumption by various industries, graphically presented in Figure 4-1. For example, pulpwood is disintegrated by chemical processes into pulp, at which stage it is further processed into paper or paperboards for the printing, packaging and construction industries. Parts of pulpwood are also shredded or otherwise processed to feed into wood-based panel productions such as fibreboards or particleboards. Another strand of products based entirely on timber is comprised of sawnwood, veneer and plywood, as well as various types of wooden boards and engineered wood products (EWP). These primary processed wood products are the basic input material for secondary processing industries such as wood furniture manufactures and joinery, or might be consumed directly such as sawnwood by the construction sector.

In South America, the majority of tropical logs are utilised by local processing industries, where 99% of all logs are converted into primary products that are consumed domestically, exported, or further processed. Similarly, domestic consumption of logs by processing industries, supported by policies with an emphasis on achieving higher rates of local processing, is the reason for the relatively high conversion rate in the Asia-Pacific region. Here only around 10% of total tropical log production is

exported unprocessed. Conversely, the rate of domestic conversion fell in aggregate in 'tropical' Africa from 82.2% in 2006 to 80.5% in 2007, regardless of government measures to promote processing industries (ITTO, 2008; 2009a). This aggregated share disguise the fact that many African countries with substantial tropical forest resources like the Democratic Republic of the Congo and Gabon still export much of their output in log form. Gabon exports nearly 60% of its raw material production in unprocessed form (Chapter 5). Given this volume of log exports Gabon is the third largest tropical log exporter globally with a share of around 17% of the total export volume of the tropical South (Data extracted from ForesSTAT by the Food and Agricultural Organization of the United Nations, <http://faostat.fao.org>, accessed January 2010).

**Figure 4-1** Forest products flow chart



**Source:** Based on Westoby (1987, p. 22)

**Notes:** EWP = engineered wood products, MDF = medium-density fibreboard, DIY = do-it-yourself; grey text boxes symbolise those forest products that are discussed most frequently throughout this thesis because they are the three dominant products produced in Gabon; no differentiation is made between saw logs and veneer logs, which are jointly referred to as logs

The top producers of tropical logs are now most often also the major consumers of their output, i.e. logs are the input for domestic wood processing industries. As a result, tropical sawnwood, veneer and

plywood are commonly produced in tropical timber-rich countries like Brazil, Malaysia, India and Indonesia. These countries jointly dominate productions in all three categories of primary processed tropical wood products (Table 4-3). In each wood product category, there are also countries among the top five Southern tropical wood product producers, which were not previously listed as major tropical log producers. For example, Côte d'Ivoire is the fifth largest producer of tropical veneer despite producing only a tenth of the log volume of Indonesia (the fourth largest producer). Contrastingly, Gabon's respective shares of the total tropical production for each wood product are small, except for veneer where Gabon's share of the 'tropical' total is close to four percent of total production of the tropical South.

**Table 4-3** Top five producers of tropical primary processed wood products and Gabon (2008)

	Sawnwood (m <sup>3</sup> )	Share* (%)	Veneer (m <sup>3</sup> )	Share* (%)	Plywood (m <sup>3</sup> )	Share* (%)
Brazil	15,455,000	30	620,000	13	2,669,000	14
Indonesia	4,330,000	8	427,000	9	3,353,000	17
Malaysia	4,466,000	9	1,005,000	21	9,207,000	48
India	4,889,000	10	...		2,154,000	11
Nigeria	...		...		...	
Viet Nam	5,000,000	10	...		...	
Ecuador	...		795,000	17	...	
Côte d'Ivoire	...		312,500	7	...	
Philippines	...		...		235,000	1
Gabon	230,000	0.4	182,000	4	85,000	0.4

*Source:* Data extracted from ForesSTAT by the Food and Agricultural Organization of the United Nations (<http://faostat.fao.org>) accessed January and August 2010

*Note:* \* Percentage share of country production of total 'tropical' production in each category

These examples indicate that, on the one hand, some countries have developed considerable processing capacities utilising large volumes of domestic production (and in some cases beyond domestic quantities, where additional raw materials are imported from abroad). On the other hand, there are countries like Gabon that do not achieve rates of primary processing production similar to the top 'tropical' producers. More specifically, given the data presented so far, Malaysia and Gabon have a more or less a similar area size of forests, yet Gabon produces six times less tropical logs than Malaysia. Whilst Malaysian processors consume large amounts of tropical logs for further primary processing activities, this rate is much lower for Gabon.

In tropical countries with expanding primary processing industries, some processed wood products are

exported whilst the remaining share in turn feeds into the domestic production of secondary products, for instance wood furniture, mouldings, window frames and floorboards. Domestic demand factors for secondary wood products reflect production levels in related primary processing sectors. For instance, a rise in demand for wood furniture stimulates production of plywood. Some of the top producers of tropical (logs and) primary wood products like Brazil, Indonesia and Malaysia, next to Viet Nam and Thailand, also produce significant volumes of tropical secondary processed wood products, particularly wood furniture (Table 4-4). In 2007, the top producers each captured between two and three percent of the global trade value (Data extracted from ITTO, 2009a). These countries hence also expanded their secondary processing capacities over time, and thus add value to their domestically produced raw material by transforming these into primary and then secondary processed wood products.

**Table 4-4** Top five producers of tropical secondary processed wood products (2007, USD thousand)

	Total SPWP	Wooden Furniture	Builder's Woodwork	Other SPWP	Mouldings	Cane and Bamboo Furniture
Viet Nam	2,970,000	2,680,000	14,000	139,000	31,000	106,000
Indonesia	2,860,000	1,210,000	472,000	347,000	431,000	406,000
Malaysia	2,630,000	1,940,000	297,000	106,000	267,000	17,000
Brazil	1,980,000	780,000	406,000	147,000	641,000	1,000
Thailand	1,250,000	810,000	51,000	252,000	92,000	47,000
World	85,500,000	51,920,000	14,280,000	11,490,000	5,590,000	2,220,000

*Source:* Data extracted from Appendix 5 in ITTO (2009a)

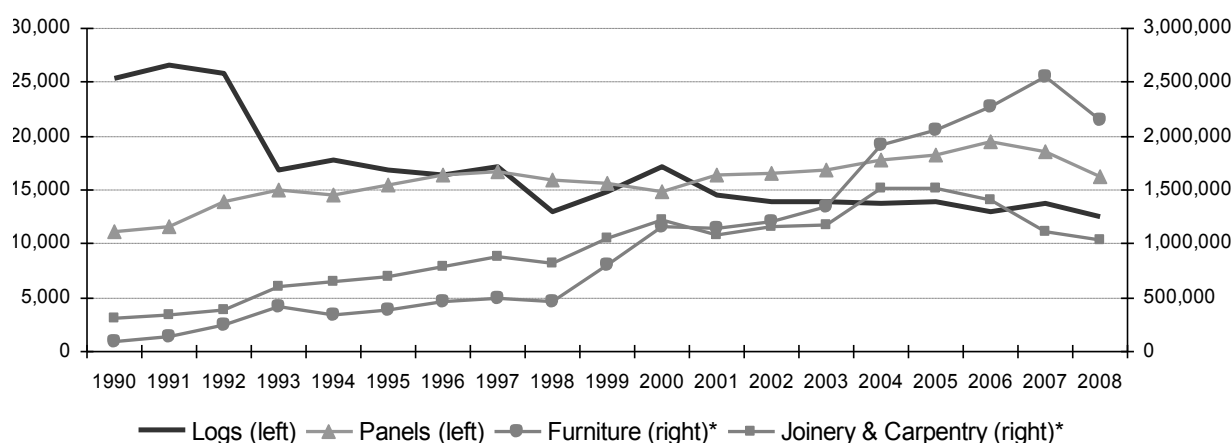
*Note:* SPWP = secondary processed wood products

Gabon does not feature in Table 4-4 as it only produces insignificant volumes of secondary wood products for export markets. In general, many developing countries' industries with substantial tropical forest reserves fail to increase the production of wood products due to reasons mentioned in the last sub-section, i.e. significant political, legal, institutional, technical and economic constraints already at the extractive levels and primary stage of processing (ADB, 2003). Furthermore, developing country processing industries are often characterised by small-scale, capital-poor enterprises, which are thus unable to compete with large(r)-scale industries in industrialised and some tropical countries that successfully achieve scale economies. Consequently, many processors in the South are confined to the sawmilling sector, where domestic industry entry barriers are lower compared to other processing sectors that are scale dependent and capital intensive (Bazett, 2000; Contreras-Hermosilla & Gregersen, 1991).

### 4.1.3 EXPORT OF TROPICAL LOGS AND WOOD PRODUCTS BY THE TROPICAL SOUTH

Based on data discussed in the previous sub-sections, there seems to be a development path of industrial upgrading from raw material extraction towards primary and then secondary processing activities for countries rich in tropical forests. In general, the value of secondary processed wood products traded worldwide increased more strongly on an annual basis than primary processed products for the past 15 years. In 2004, the value of exports of secondary processed products equalled those of primary products, and has since then been higher than the aggregate total value of primary wood product exports (ITTO, 2009a). Consequently, as more tropical logs are utilised domestically, global tropical log exports are decreasing while the export volume of tropical processed wood products is increasing. Figure 4-2 displays the export trends for logs, primary processed wood products (represented by panels) and secondary wood products (represented by wood furniture, as well as joinery and carpentry products).

**Figure 4-2** Tropical log and wood product exports (CUM and kilogram thousand)



**Sources:** Data extracted from ForesSTAT by the Food and Agricultural Organization of the United Nations (<http://faostat.fao.org>) accessed January and August 2010, and Comtrade by the United Nations Statistics Division (<http://comtrade.un.org>) accessed August 2010

**Notes:** \* Comtrade data reported in thousand kilograms (FAO does not report production and trade data of secondary wood products); panels include hardboards, insulating boards, particleboards, plywood and veneer; joinery/carpentry product group includes doors and window frames, shingles and shakes, as well as undefined (other) wood manufactures

Exports of all three types of processed tropical wood products have risen, whilst the aggregate export volume of logs decreased over time, specifically in the early 1990s. At first glance, this appears to have been a satisfying development from the perspective of those processing countries in the South, like Brazil, Viet Nam, Indonesia and Malaysia, that managed to adopt value-adding product and processing capacities. In other words, the observed progress in domestic wood utilisation can partly be ascribed to

Southern producers' ability to acquire the necessary 'upgrading' skills<sup>45</sup> to add value to their domestic raw material stock. Still, this achievement is confined to a limited number of countries. On a global scale, Gabon is amongst the top global producers of tropical logs but exports relatively small volumes of primary processed wood products compared to the leading producer countries and almost no secondary wood products.

#### 4.1.4 IMPORTS OF TROPICAL LOGS AND WOOD PRODUCTS GLOBALLY

Traditionally the OECD economies were the largest importers of tropical logs from producers in the South, given the dependence of these tropical-poor countries' processing industries on tropical log imports. More specifically, the North imported around 78% of the global trade of tropical logs in 1990 (Table 4-5). Japan and the Republic of Korea alone received more than half of all global tropical log imports. The traditional trade flow direction originated in the South and was directed towards the North. This situation has changed drastically since the mid 1990s as the North started to outsource primary processing activities to the South (and reduced overall consumption levels). The latter is partly a result of rising domestic wage levels and the associated loss of competitiveness to the South, as well as due to consumer pressures on the sustainability of tropical log imports and residing resource needs in light of substitution possibilities (Bowyer et al., 2004; Kaplinsky et al., 2010; Section 4.3).

**Table 4-5** Global tropical log import shares for top importers and the OECD

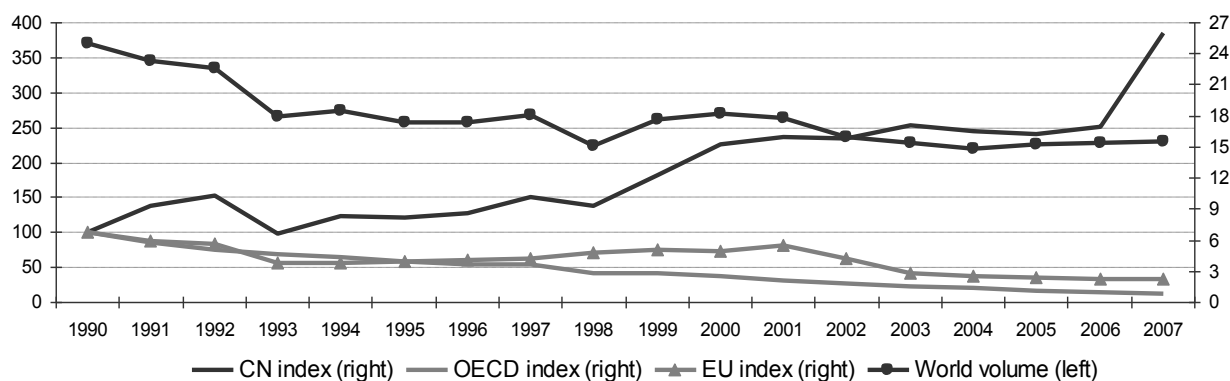
1990		1997		2007	
Country	Share (%)	Country	Share (%)	Country	Share (%)
Japan	39.5	Japan	32.3	<b>China</b>	<b>68.2</b>
Korea, Rep.	16.1	<b>China</b>	<b>29.2</b>	India	17.2
<b>China</b>	<b>13.9</b>	Korea, Rep.	6.5	Japan	3.8
Thailand	8.1	India	5.5	France	2.1
India	4.7	Thailand	4.5	Thailand	1.3
France	3.6	France	3.7	Spain	0.9
Italy	2.9	Philippines	3.7	Korea, Rep.	0.8
Portugal	2.1	Norway	2.2	Italy	0.8
Spain	2.0	Pakistan	1.9	Turkey	0.7
Germany	1.4	Portugal	1.8	Portugal	0.6
<b>OECD</b>	<b>78.3</b>	<b>OECD</b>	<b>53.2</b>	<b>OECD</b>	<b>11.0</b>

Source: Data extracted from ForesSTAT by the Food and Agricultural Organization of the United Nations (<http://faostat.fao.org>) accessed October 2009

<sup>45</sup> Next to having met other conditions like skilled workers, sufficient (capital) inputs, scale economies and so forth.

While OECD tropical log imports fell by 87% between 1990 and 2007, China's imports grew by close to 300% over the same period (Figure 4-3). Chinese processing industries currently consume around 68% of the global tropical log trade volume, compared to a share of 11% for OECD economies in aggregate (Table 4-5). It is interesting to note that while China's share of the world total is already extremely high, the absolute total world import volume initially fell, i.e. from nearly 25 million cubic metres of total imports in 1990 to 15 million cubic metres in 1998, which is the approximate current total import volume after a temporary increase. The sharp drop in the 1990s can be attributed to declining tropical log import volumes by OECD countries (1990: 20 million cubic metres, 2007: two million cubic metres) and rising domestic tropical log utilisation rates in the South (Section 4.1.3). Contrastingly, absolute volumes imported by China rose from 3.5 million cubic metres in 1990 to 13.5 million in 2007. Hence, China's import volumes increased over time and are significantly large to counterbalance falling log requirements from OECD countries, stabilising global tropical log import volumes.

**Figure 4-3** World tropical log import quantity (CUM million), tropical log import index for China, the OECD and Europe (1990 = 100)



Source: Data extracted from ForesSTAT by the Food and Agricultural Organization of the United Nations (<http://faostat.fao.org>) accessed October 2009 and April 2010

These significant changes in global log trade patterns have already induced global tropical log trade flows to change as they are now directed towards China. The Chinese economy has clearly replaced the North as the driver of global tropical log trade. This is due to both diminishing processing activities in the North and due to China's own significant resource requirements (Section 4.2). The shift of the market for tropical logs, whereby China replaced the North, is of particular relevance to tropical forestry industries in the South. This is because previous sub-sections documented that there are industries, often in Africa, which have access to tropical forest stocks, but which export large volumes of logs relative to processed wood products. Such industries are hence faced with falling log requirements

though a simultaneously increasing demand for wood products from the North, as well as strong demand for raw materials from China.

The entrance of China not only as a consumer of tropical logs but equally as a labour-abundant processor (Section 4.2) can be expected to induce changes in the global trade structure of tropical wood products, too. For example, the ITTO (2009a, p. 23) ascribes declining sawnwood imports by the EU partly to “the loss of SPWP [secondary processed wood product] manufacturing capacity as a result of strong competition from Asian manufacturers (particularly China)”. Along similar lines, Eastin (2005, p. 1-2, 6) states that the US industry is “already adversely impacted by a wide variety of factors and constraints in China that erode the competitiveness of [US industry] products in China, [and that the US industry] must now contend with rapidly increasing Chinese exports of wood products. .... Chinese plywood exports ... are displacing US plywood exports from their traditional markets”. Diminishing processing activities in the North are thus a result of loss of competitiveness to Southern processors in general, and specifically China.

It is not possible to replicate Table 4-5 to evidence changes in global imports of tropical wood products, due to the nature of available trade data. These do not differentiate for most primary and all secondary processed wood products between tropical and non-tropical (or at least non-coniferous and coniferous) wood. Moreover, in many cases data are not available for the period 1990 until 2008, thus making an analysis of changes of dominant importers of tropical wood products over time impossible. Instead, the following section (Section 4.2) documents developments of Chinese processing industries of tropical timber. Furthermore, subsequent chapters discuss the specific case of Gabon, including data on France’s and China’s distribution of forest products imports from Gabon. By definition, all exports from Gabon to France and China are tropical logs and wood products. It is thus possible to document that the North (represented by France) outsourced processing activities to the South, i.e. Gabon, while reducing the consumption of tropical logs. The discussion of the possible impact of China’s rising processing activities on those in the North, or the tropical South in general, is beyond the scope of this thesis.

## **4.2 THE CHINESE MARKET AND DOMESTIC PROCESSING INDUSTRIES**

China is a relative wood-resource poor country with a forest per capita rate of 0.13 hectare relative to a

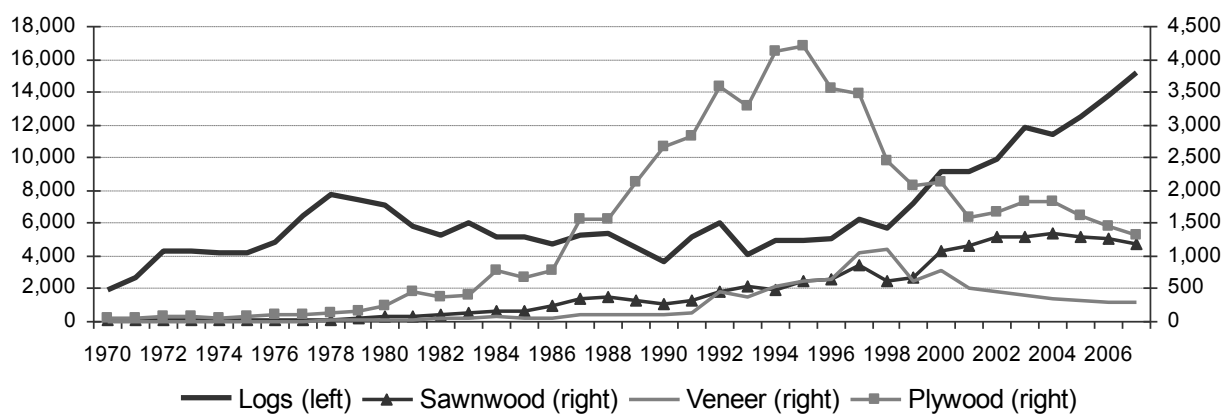


world average of 0.65. This relative wood fibre deficit can largely be attributed to extensive domestic logging activities as early as 1,000 B.C. and continuing to the late 1950s when it was particularly pronounced (Démurger et al., 2007; Williams, 2000). In an attempt to stop further deforestation, environmental degradation and consequential events like landslides, the Chinese government imposed strict logging restrictions in 1998, which are embedded in the National Forest Protection Programme (Chunquan et al., 2004). China's domestic tropical forest areas are limited to two southern provinces. The domestic tropical log output of around four million cubic metres from these areas is insufficient to satisfy total demand (ITTO, 2009a). Chinese government officials reported a total wood gap of 140-150 million cubic metres in 2006 alone (Canby et al., 2008).

#### 4.2.1 IMPORT STRUCTURE OF LOGS AND WOOD PRODUCTS

The structure of China's imports of tropical logs and wood products shows a preference of Chinese processing industries for tropical raw materials (logs) over primary processed wood products (Figure 4-4). To put it differently, imports of plywood, which are often based on tropical logs and veneer, started to fall sharply by the mid 1990s after a long period of pronounced growth. Contrastingly, the total import volume of tropical logs increased by around seven percent per annum during the period 1970 to 2007. The rise in tropical log imports became particularly pronounced after 1993, totalling a 321% increase up to 2007. Tropical sawnwood imports grew on average 15% annually since 1970, yet started to decrease in 2005 by around 4% per year. Likewise, veneer imports show a negative trend as of 2001, although the drop is relatively less pronounced and the absolute level was always lower than that of the other two types of primary wood products.

**Figure 4-4** China's import structure of tropical logs and selected wood products (CUM thousand)



Source: Data extracted from ForesSTAT by the Food and Agricultural Organization of the United Nations (<http://faostat.fao.org>) accessed October 2009

Taken as a whole, the changes in the structure of China's imports are directly related to structural transformations of Chinese processing industries (detailed discussion in section 4.2.3). Chinese industries have upgraded their abilities to undertake activities further downstream in the value chain over time, thus no longer requiring wood products but the input material to produce them domestically (Adams & Ma, 2002; Kozak & Canby, 2007; Sun et al., 2008). For instance, China used to import plywood in the past but became a net exporter after 2001 (Eastin, 2005; White et al., 2006). Data hence portray a situation of growing domestic processing capacities of Chinese industries faced with domestic resource shortages, which are replenished by logs from overseas.

#### **4.2.2 CONSUMPTION AND EXPORTS**

Wood consumption rises as the population grows and/or as more disposable income is available to the given population (Bazett, 2000; de Fégely, 2005). In other words, as peoples' incomes rise part of this income will be spend on wood products<sup>46</sup>. Over time, not only the volume but also the quality of wood products are likely to increase as consumer tastes develop. For instance, in China paper production based on non-wood fibres such as rice straws was replaced by high-quality paper made of plantation pulpwood (White et al., 2006). Given China's economic growth (plus population increases) over the past decades with positive impacts on disposable incomes and especially industry growth, wood consumption almost doubled within ten years from around 145 million cubic metres in 1993 to 283 million cubic metres in 2003 (Démurger et al., 2007).

Current per capita consumption of wood in China is still relatively low at an estimated 0.12 cubic metre per capita compared to a world average of 0.68 in 1997 (Chunquan et al., 2004; Kunshan et al., 1997)<sup>47</sup>. As incomes continue to rise wood product consumption per capita is predicted to increase, too. For instance, Trinh et al. (2006) project an increase of average annual imports by ten percent until 2020, based on other countries' consumption over time, whose economic growth pattern China is likely to imitate (e.g. South Korea, Japan and Spain). Using the same method, i.e. predicting China's consumption 'path' based on developed countries' historical consumption intensities, Midgley (2005) places China's current paper and board consumption at a low level and thus predicts a further

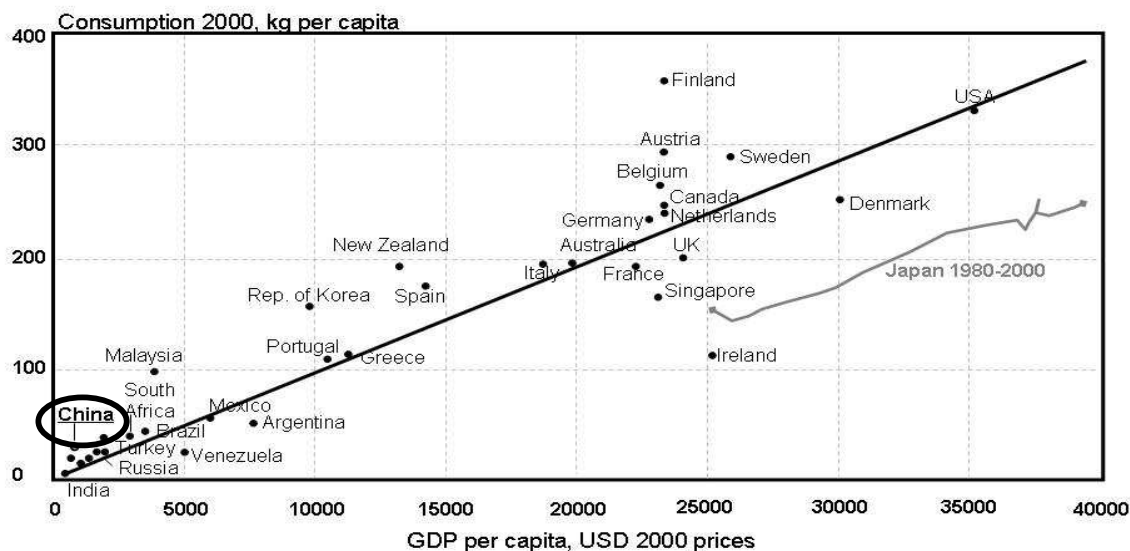
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<sup>46</sup> This statement of an increase in demand due to an increase in income holds for China with a relatively low per capita GDP, but does not apply to countries with higher per capita income levels where the income elasticity is probably falling. Midgley (2005) further notes that cultural preference can influence the function of income on demand for wood products.

<sup>47</sup> Alternative per capita consumption rates are given by Stark and Cheung (2006) for paper: China 36kg, USA 301kg, World 53kg; as well as by Rutten and Hock (as cited in Adams & Ma, 2002) for plywood: China 9 m<sup>3</sup>/1,000 people, USA 67 m<sup>3</sup>/1,000 people, World 10 m<sup>3</sup>/1,000 people.

intensification of China's consumption in the future (Figure 4-5). Among industry experts and scholars there is the general agreement that China's aggregate wood consumption (and thus imports) can only be of one direction, which is upwards.

**Figure 4-5** Paper and board consumption intensities



Source: Midgley (2005, p. 54)

One engine of growth of wood processing industries is the rise in private consumption, which is particularly related to the high growth of the construction and housing sectors (Démurger et al., 2007, Stark & Cheung, 2006, Sun et al., 2004). The boom in China's housing sector was facilitated by the state's National Housing Reform Programme, which allows for private ownership of domestic residences coupled with an easier access to capital (Castaño, 2002; Chunquan et al., 2004). The programme aims to construct new houses (five billion square metres) and renovate existing housing units (two billion square metres) until 2010. Apart from the state project, it is estimated that about ten million new housing units are built annually. For comparison, this is five times the housing construction rate in the United States of America (Midgley, 2005).

Not only does the absolute number of housing units increase but also their size. As Bowyer et al. (2004, p. 5) state, "... apartment units being built today provide approximately 20-24 square metres ... up from 4 square metres per resident less than 25 years ago". For each square metre of floor area roughly 0.025 – 0.045 cubic metres (urban rate) of wood is used in the construction process. While tropical wood was not commonly used in constructions in the past, increasing numbers of mouldings, doors and partitions are constructed from wood, including tropical timber (Bowyer et al.; Castaño,

2002; Chunquan et al., 2004). Moreover, the occupation of new housing units plus the refurbishment of existing ones directly translates into higher consumer demand of wooden furniture and decorative items. To give an example, Chunquan et al. report that domestic wooden furniture consumption (including those made from tropical timber) increased from US\$6 billion in 1995 to US\$9 billion in 2000.

Although domestic consumption of wood products is in itself strong, the second engine of growth of Chinese processing industries is the massive overseas demand for wood products. Final destinations of wood products made from imported tropical logs are often OECD countries and increasingly the Middle East. For example, exports of tropical wood products in aggregate to the USA increased by 1,000% and to the EU by 800% between 1997 and 2005 (White et al., 2006). Disaggregated to selected wood products, exports to the USA increased by a factor of five or higher for furniture and decorative items respectively over the course of ten years, and rocketed by more than 2,000% for builders' joinery and carpentry, as well as mouldings. Similarly, there is a rise in export quantities of joinery and carpentry (factor of 12), mouldings (factor of 22), and furniture (factor of 5) to Europe<sup>48</sup>.

It was noted earlier that in order to satisfy wood product demand of both the domestic and the export markets, Chinese domestic processing industries strongly depend on imported raw materials. Research has shown that China's total domestically produced processed wood volumes are equivalent to over 70% of its log import volumes (White et al., 2006). In other words, some industries, like export-orientated tropical plywood manufacturers, are thought to depend almost completely on imported wood, which are processed into veneer for plywood (EIA, 2005a; Global Timber, n.d.-a). As Sun et al. (2008, p. 16) conclude, "... no other country has ever, in human history, developed a re-export-orientated forest industry based primarily on imported wood, and certainly not at this scale". It is for this reason that Chinese wood processing industries have earned the label 'wood workshop of the world'.

#### **4.2.3 DOMESTIC WOOD PROCESSING INDUSTRIES**

With respect to both domestic and global markets, the strongest tropical timber consuming industries in China are the furniture, plywood, wood mouldings and flooring industries. All Chinese wood processing industries have reported annual double-digit growth rates for at least a decade, and are now often leading global producers and/or exporters. For example, China is the world's largest manufacturer of

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<sup>48</sup> Data extracted from Comtrade by United Nations Statistics Division (<http://comtrade.un.org>) accessed April 2010.

veneer with a global market share of over 30%, and the top export nation of wooden furniture and mouldings (Table 4-6). Because of the industries' high labour-intensity, they are estimated to create between 12-15 million jobs per year (Kozak & Canby, 2007). The structure of processing industries has changed dramatically over the past twenty years from a system of state-approved monopolies towards a diverse landscape of mostly privately owned companies, traders and speciality wood distribution markets (Cao et al., 2004; Sun et al., 2008; TFT, 2007).

**Table 4-6** China's global rank in the production and exportation of selected wood products (2007)

Product category	China's world 'producer' position	Volume (1,000 m <sup>3</sup> )	World total volume* (1,000 m <sup>3</sup> )	Share (%)
Sawnwood	2	18,000	94,000	19
Veneer	1	2,000	6,000	32
Plywood	2	15,000	34,000	44
Product category	China's world 'exporter' position	Value (1,000 US\$)	World total value* (1,000 US\$)	Share (%)
Wood furniture and parts	1	10,866,000	51,925,000	21
Builder's carpentry and joinery	4	1,084,000	14,283,000	8
Mouldings	1	794,000	5,585,000	14

Source: Data extracted from ITTO (2009a)

Note: \* Not all countries, but a sufficiently large number (especially the top players in the industry), which participate in international trade are also ITTO members; ITTO data are thus used as a proxy

Whereas China's strong economic growth rates laid the foundation, several other factors enabled the expansion of processing industries: a history in wood processing (especially furniture), abundant labour, comparatively low production and transaction costs, access to inexpensive capital, sufficient imported raw materials, wood waste recycling, and a favourable trade regime, which through import tariffs encourages the import of raw material but not wood products (Castaño, 2002; Kozak & Canby, 2007; Sun et al., 2008; Xu et al., 2004). Additionally, the improved business environment (and the large domestic market) attracted foreign investors like internationally known retailer IKEA, with modern processing technologies and managerial expertise, who further helped to kick-start developments, especially in the (tropical) plywood and furniture sectors (Adams & Ma, 2002; Cao et al., 2004; Rutten & Hock, 2004).

Given the sheer number of companies, many industries' low barriers to entry and exit, little product differentiation and now increasing raw material prices, the degree of competition between processors is extremely high, often leading to an erosion of profit margins. As a result, many processing mills are

thought to survive due to state subsidies, e.g. value-added tax rebates and below-market interest rates (Eastin, 2005; Sun et al., 2008; TFT, 2007). Furthermore, with the exception of some large foreign enterprises or joint ventures, wood processing companies currently follow a low-cost/low-price competitive strategy with a focus on quantity rather than quality. To give an example, furniture products are usually of low to medium quality with weak designs. The same holds for panels, which were described to be of poor quality (Castaño, 2002; Sun et al., 2008). Whereas plywood exports are generally of lower value, China continues to import high-value tropical plywood from abroad for domestic consumption (Rutten & Hock, 2004; White et al., 2006).

Chinese wood products compete through price on international markets<sup>49</sup>. Processing industries have also shown that they are highly adaptive to consumer demands, technological changes, and structural changes within the industry. It is likely that processing industries will continue to attract foreign investors based on its production cost advantages<sup>50</sup> and relative efficiencies (timber utilisation rates), next to the size of China's domestic consumer market. An intensification of competition will probably lead to an increasing number of larger companies, which can achieve economies of scale. Experts further believe that there are upgrading and innovation potentials (Adams & Ma, 2002; Cao et al., 2004). Given the sectors' employment numbers and above-average growth rates, the state is thought to continue to provide support to otherwise failing (small-medium scale) enterprises and the industry at large.

Nevertheless, Chinese industries are momentarily not as sophisticated as their Northern counterparts are with respect to the quality of final products and the applied technology as mostly small-to-medium sized companies dominate the processing industries<sup>51</sup>. To give an example, the North developed the technology to increasingly substitute high value logs from tropical forests with plantation wood of smaller diameter and hence differing wood fibre characteristics (see Section 4.3). Yet, Chinese industries are believed to continue to demand large diameter logs from first/second growth, natural

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<sup>49</sup> It is said that due to the large influx of illegal logs to China "is estimated to depress domestic timber prices in China by approximately 5%" (Eastin, 2005, p. 3), thus artificially creating a competitive advantage for Chinese processing industries compared to those (in the North) procuring legal logs.

<sup>50</sup> It is not yet clear how rising raw material prices and labour costs, as well as decreasing import tariffs, will affect the degree of (inter)national competitiveness of processing industries, especially plywood mills. However, some authors state that changing production costs might lead to further innovation, e.g. tropical face veneer is already sliced thinner to compensate for rising tropical log prices, and that a reduction of import tariffs will further increase domestic competition (see e.g. Cao et al., 2004; TFT, 2007).

<sup>51</sup> This statement does not necessarily apply to large-scale wood product processing companies based on foreign investments from Europe, the USA and Japan, who have recently started to outsource parts of their domestic productions to China for reasons of competitiveness, nor the paper industry.

forests (Bowyer et al., 2004; Sun et al., 2008). Moreover, tropical rainforests mainly produce non-coniferous trees, which cannot easily be substituted with softwoods and temperate hardwoods extracted from boreal as well as temperate forests (Bazett, 2000). The mass of Chinese processing companies currently lack the means to replace tropical logs with other types of woods.

#### **4.2.4 NON-SUSTAINABLE TROPICAL LOG PROCUREMENT**

Chinese processing industries seem to devour globally sourced tropical logs to fuel its domestic processing industries. Yet, around 50% of Chinese log imports are believed to be from illegal sources, due to porous governance systems in supplier countries, OECD consumer demands for cheap wood products, as well as a supposed attitude of indifference from Chinese processors and the government (EIA, 2005a, b; Greenpeace, 2005). Illegal log trade has always been an issue of concern to parties outside and within the industry due to its impacts on prices, as well as foregone earnings and government revenues (Section 4.1.1). However, there are a number of studies, field reports, and expert testimonies that clearly identify China as the centre (and allegedly accelerator) of illegal tropical log extractions and trade (Barney, 2005; Greenpeace, 2005; Katsigris et al., 2002; Laurance, 2008; Sun et al., 2004; White et al., 2006).

Official government statements and actions appear to portray an acknowledgment and effort to control illegal log trade to China for further processing, e.g. through the production of draft national certification standards and green procurement policies, the government's participation in FLEGT<sup>52</sup> discussions, increasing engagement with NGOs and stricter import controls (Chunquan et al., 2004; Wang et al., 2008). However, industry experts often claim that only insignificant progress is being made, for example, as necessary changes are not given a high priority status, as commitments are not followed by practical actions, and as engagement with international institutions "is still in its infancy" (EIA, 2005a; Fripp, 2006, p. 16; ProForest, 2009; Stark & Cheung, 2006). For example, Fripp (p. 16) writes, "... there are no clear signs of either the government or private sector companies developing their own procurement policies or environmental codes of conduct...". Furthermore, the government frequently took the position that illegal timber logging is a problem of producer countries driven by end-consumers in OECD countries, and thus not necessarily an area requiring immediate action by the Chinese government (TFT, 2007).

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<sup>52</sup> See section 4.4 for details.

The wider implications of traders' and processors' sourcing decisions, like deforestation and loss of government revenues in supplier countries, seem not to be discussed in the public domain in China, or to a far lesser degree than in many OECD countries (Eastin, 2005; Fripp, 2006). In contrast, it is often said that investigative work and/or publications by international NGOs and journalists are constantly monitored and prohibited if necessary (James Hewitt, pers. comm., March 2010). Media coverage of the impact of unsustainable harvesting methods and illegal trade is hence low and exerts less pressure on buyers and Chinese consumers (ProForest, 2009). Moreover, processors and traders have limited managerial knowledge to document product flows, and they act in a fiercely competitive environment with eroding profit margins. Consequently, the degree of awareness is marginal and processors stay in business by accepting lower-priced logs from illegal sources, as well as by taking advantage of few given environmental restrictions, including an absence of enforced national legality and sustainability certification schemes (Cao et al., 2004; Chunquan et al., 2004; Eastin, 2004; TFT, 2007)<sup>53</sup>.

Lastly, not only is the government accused of turning a blind eye to processors' sourcing decisions within China but also to provide active support to Chinese logging companies abroad. Put differently, the Chinese government is thought to support the entrance and activities of Chinese timber extractors specifically in tropical-rich countries with weak national governance system. This is exemplified by the following statements, where "China's sources for hardwood log imports reads like a who's who of countries with problems with illegal logging" (EIA, 2005a, p. 3; Eastin, 2005). The WWF states that "... it is likely that at least some of the major logging companies that supply China [from Gabon] are supported by China's diplomatic effort" (2006, p. 43). Furthermore, "Chinese companies' sparse environmental- and developmental behaviour is evidently supported rather than constrained by its own government" (Böhringer et al., 2007, p. 17).

#### **4.3 THE EUROPEAN MARKETS AND KEY GLOBAL INDUSTRY CHANGES**

The subsequent sections introduce the historical developments of mostly European wood-related industries, as well as changes of consumer attitudes over time. The discussion draws from the forest transition model (strongly associated with work by Mather and Needle (Mather, 1992, 2001; Mather &

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<sup>53</sup> Instead, industry experts believe that the demand for the certification/labelling of tropical logs and wood products, including the verification of origin, has largely to be driven by consumers in the North. For example the American Forest and Paper Associations (2004, p. 139, emphasis added) notes, "In China, there are exactly two very small forest properties that have been certified, and only 66 companies have chain-of-custody from FSC for producing products (*all for export, of course*)". This topic will shortly be revisited in Chapter 9 of this thesis.



Needle, 1998, 1999), as well as Rudel (Rudel, 1998; Rudel et al., 2005), which describes the changing patterns of wood utilisation and forest resource exploitation. In more detail, "The phases are differentiated by the nature and diversity of goods and services sought from the forest, the importance given to wood production as a management goal and the legitimacy given by the public to differing approaches to forest management" (Bazett, 2000, p. 1). Additionally, other important changes in the global industry are highlighted that shed further light on the structural changes of European wood processing industries.

#### **4.3.1 THE FOREST TRANSITION MODEL**

During the pre-industrial phase of economic development in the North forest areas were predominantly used for grazing, the collection of fodder, fuelwood and non-wood forest products, as well as for timber extraction. Put differently, until some time in the 18<sup>th</sup> century, forests were a hybrid of agricultural as well as timber production (Victor & Ausubel; Williams, 2000). During the following industrial phase, trees were 'mined' until depletion in most parts of the North through an expansion of the extensive margin (Bazett, 2000; Hyde & Sedjo, 1993; Mather 1992). Given the economic value of timber and the increasing scarcity of forestland, forests were increasingly geared towards the specific production of timber over the ensuing years. This change was accompanied by the emergence of scientific research and resulted in the application of a sustained-yield management system of forests. The new forest management system accordingly required new forms of ownership, i.e. more and more forest areas were privately owned enclosures, thereby replacing communal forests of the past (Humphreys, 2006; Mather, 2001).

Nonetheless, timber shortages persisted in Europe and later in its 'newly depleted' outposts in North America (Bazett, 2000; Hyde & Sedjo, 1993). Instead, colonies in Africa and Asia were drawn on to fill the domestic wood gaps, i.e. colonies were often treated as so-called resource taps (Jorgenson, 2008). Much of the tropical deforestation of the late 19<sup>th</sup> and early 20<sup>th</sup> century can thus be attributed to export-directed logging activities. It also seems that the 'modus operandi' of the forestry industry had been adopted in tropical countries, where the overwhelming majority of logging took place through an expansion of the extensive margin. Additionally, property right regimes had been 'exported' to the former colonies, whereby forests increasingly came under state authority for its primary objective of timber extraction, which consecutively led to similar changes in ownership as documented for Europe,

i.e. a strong reduction of common property systems (Humphreys, 2006; Keal, 2003; White & Martin, 2002).

As of the 1950s, the forest transition towards the post-industrial phase manifested itself through changes in the perceptions of the purpose of forests, corresponding changes in forest management systems and an expansion of forest area cover mainly in the North (Mather & Needle, 2000; Westoby, 1987). Most importantly, societal perspective on the functions of forests began to change, where an increasing number of affluent people living in cities exerted pressure on foresters to cater to their needs for recreation and regeneration, and through pressures from environmental advocacy groups denouncing the loss of biodiversity (Bazett, 2000; Mather & Needle, 1999, 2000; Nilsson, 1996). At the same time, urban migration created a labour scarcity in rural areas that, combined with technology-induced yield increases in agriculture and forestry, led to an abandoning of land thus made available for forest expansion (Ewers, 2006; Kauppi et al., 2006; Rudel et al., 2005).

One can thus observe a clear shift away from the previous 'timber primacy' towards a better understanding and recognition of the forests' multiple functions in the North. Forest functions are i) forest services such as biodiversity and watershed protection, carbon sequestration, and recreational spaces, as well as ii) non-wood forest products like food, fodder, botanical medicines and building materials (FAO, 2006b; UNCSD, 1998). The new ideas of what forests are ought to be, as well as how products and services are supposed to be delivered, are also reflected in policies and management practices. With respect to the latter, there is a trend away from old growth sustainable-yield exploitation towards sustainable forest management<sup>54</sup> (SFM) of (planted) forest ecosystems (Bazett, 2000; Sohngen et al., 1997). Furthermore, researchers observed changes in the associated values and attitudes of people towards forests, as well as the emergence of a transparent and consultative administrative system, for example, an effective enforcement of forest law and community participation (Kauppi et al., 2006; Mather & Needle, 2000). In short, the forest transition model is based on the observed return of the forests in the North, which is attributed to economic development,

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<sup>54</sup> A universally accepted definition of SFM does not exist. The ITTO defines it as "the process of managing forest to achieve one or more clearly specified objectives of management with regard to the production of a continuous flow of desired forest products and services without undue reduction of its inherent values and future productivity and without undue undesirable effects on the physical and social environment"; whereas the FAO states that it is "the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems" (as cited in UNEP, 2003, p. 3; see also World Bank, 2004).

industrialisation and urbanisation, complemented by democratic political systems and changes in recognition of non-monetary values of forests.

#### **4.3.2 SELECTED GLOBAL INDUSTRY CHARACTERISTICS**

Intensively managed plantations, or so-called wood fibre farms, are the single dominant innovation of the Northern forest industry after the introduction of chain saws at the end of World War II (Sedjo, 1997). Driven by financial constraints (high production and environmental costs, rising tropical log prices and price competition) the new plantations increasingly resemble systems of agricultural production, i.e. control of species and location, tree growth, tree and fibre quality, as well as the strategic application of technological and biological innovations (Bull, 1999; Carle & Holmgren, 2008; Sohngen et al., 1997). Whereas these innovations first occurred in the North, low-cost producers in tropical countries such as Brazil, Indonesia, Chile and Thailand are entering the market, too, albeit with a comparative advantage of shorter rotation cycles and higher yields than the North (Bazett, 2000; Bowyer et al., 2004).

Given the changing nature of wood products from second-growth and plantations, the industry is continually adjusting to smaller log diameter sizes and changing fibre quality (Bazett, 2000; Sedjo, 1997). At the same time, upgrading of wood products and processing methods has allowed the inclusion of a broader range of tree species into industrial production. This also includes the possibility to substitute (tropical) non-coniferous for coniferous wood products, hence allowing a reduction of tropical log consumption. Additionally, new products such as engineered laminated veneer lumber (LVL) and I-beams can now be produced using fewer inputs, including what would have been residuals in the past (Victor & Ausubel, 2000). Lastly, advances in the degree of recycling have eased some of the previous supply pressures (Bazett, 2000; Sedjo, 1997).

In contrast to these technical innovations in the North, the low capital requirements needed for the extraction and conversion of tropical logs often into sawnwood allow many small-scale sawmills, albeit still relatively inefficient in its production, to exist in many developing countries (Section 4.1). Here, the tropical forestry industry is relatively fragmented, often located near forests and serving domestic markets (Bazett, 2000) thus failing to achieve economies of scale and to utilise the resource base in a more productive way as demonstrated for most Northern industries and some (plantation-based)

industries in selected developing countries. Yet, partly because of the existence of scale economies, there is some concentration of transnational companies in the Northern non-tropical primary processing industry, and to a higher degree in the capital-intensive non-tropical secondary processing sectors (especially in pulp and paper). According to a publication by WWF (n.d.-a) the top 50 international processors may have consumed up to 43% of the global annual roundwood harvest.

Transnational companies often have a long history of logging and processing activities also in the tropical South, for instance, European companies in Africa or US companies in the Philippines (Sizer & Plouvier, 2000). The extractive activities have often had negative environmental and socio-economic consequences due to the short-term profit orientation, as well as lack of governance and weak enforcement capacities of the host country (Dudley, 1995; Dudley et al., 1995; Forests Monitor, 2001). In fact, both empirical studies and field reports argue that international companies may operate in developing countries exactly because of their weaker socio-economic and political situation. Jorgenson and Clark (2008) state that partly due to lax or absent environmental regulations foreign TNCs outsource labour and portions of their environmental costs associated with extraction and production activities to developing countries.

Since the late 1990s, the origin as well as to some degree the patterns of foreign capital is changing towards more frequent instances of 'South-South' investments. According to Sizer & Plouvier (2000), particularly Malaysian and Indonesian companies actively seek new investment opportunities in the extractive sector in all three tropical regions, i.e. countries like Papua New Guinea, Suriname, Cameroon and Gabon. These investments are usually driven by domestic/regional wood shortages but growing domestic processing industries with increasing log requirements. While the logging operations are often similar in its patterns to traditional investors, i.e. driven by resource needs and competitive pressures, the 'Asian' investors seem to be more mobile in their capital deployment (especially in Africa) and use relatively large numbers of imported labour. The new investors often are believed to ignore global industry trends towards sustainable forest management practices. Information on Chinese investors in tropical forest countries is mounting ranging from case studies in Papua New Guinea to several African countries (Böhringer et al., 2007; Canby et al., 2008; Greenpeace, 2005), thus suggesting a significant recent influx of Chinese businesses, i.e. 'third-wave' investments following Northern and Malaysian/Indonesian producers.

#### **4.4 THE GLOBAL FORESTRY GOVERNANCE SYSTEM AND STANDARDS**

Many of the processes described in previous sections do not take place in isolation. Indeed, national forestry industries may be a vital part of national economic and/or industrial development policies and thus are not free from external regulation (see also Chapter 5). Furthermore, trade is co-ordinated through basic principles of the General Agreement on Tariffs and Trade (GATT) and thus is governed by an international trade regime. In addition, the increasing awareness of the multiple functions of the world's forests, like its positive services as carbon sinks, runs parallel to the ongoing destruction of particularly tropical rainforests. As a result, consumers of tropical timber began to demand more stringent rules concerning the extraction of resources through international environmental regulations and/or global standards.

The global forestry governance system is a compound of multilateral environmental agreements (MEAs), international environmental laws, regional agreements, national legislation, trade laws and global standards introduced by private-public actors both external to and part of the forestry industry. A single holistic forest convention does not exist to date and is unlikely to be agreed upon in the near future due to technical and political reasons. For instance, it is argued that the multiplicity of property rights associated with forests (global public goods, local commons, or sovereign resources) among various stakeholders at the domestic and international level confuses policy formulation in each segment of the governance system and regarding agreements on a holistic, global level (Bass, 1997; Brown, 2001; Chaytor, 2001; Humphreys, 2006).

##### **4.4.1 MULTILATERAL ENVIRONMENTAL AGREEMENTS**

The bulk of forest-related multilateral environmental agreements (MEAs) make no references to trade of wood and other forest products and are not legally binding. They are thus subject to voluntary implementation and enforcement by signatory parties. These so-called 'soft laws' include the Forest Principles (management, conservation and sustainable development of forests; UNCED), Chapter 11 of the Agenda 21 on the combat of deforestation, FAO's Strategy for Forestry (currently under revision, focus on sustainable forest management), as well as Proposals for Action from the Intergovernmental Panel on Forests and the Intergovernmental Forum on Forests (elaborate list of suggestions and policy recommendations; UNFF). Without going into the details of each individual agreement, it should be pointed out that many soft-laws often pursue specific interests, like the combat of deforestation or the

support of changes to forest management systems in individual countries, and/or are time bound. The agreements may overlap and even contradict each other thus maintaining its potential for conflict from a legal perspective (Brown, 2001; Chaytor, 2001; Lesniewska, 2005).

The most important 'environmental' treaties in view of the global forest industry and trade are the International Tropical Timber Agreement (expansion of trade of sustainable managed and legal tropical logs; ITTA), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (trade restriction of endangered [tree] species; CITES), and the Convention on Biological Diversity (conservation, sustainable usage and equal benefit sharing of biological diversity, trade restrictions possible; CBD) (Eckersley, 2004; Lesniewska, 2005). All of the above treaties are legally binding to the signatory countries, but in spite of the fact these three treaties include trade-related aspects, it is not clear whether they are in accordance with international trade laws (e.g. a violation of treating countries with similar status less advantageously). To this date, none of the trade aspects of the above-mentioned MEAs have been formally challenged and thus brought forward to the Dispute Settlement Body of the World Trade Organisation (WTO). Most authors agree that WTO jurisprudence will prevail, if a formal challenge is lodged (Eckersley, 2004; Humphreys, 2006).

#### **4.4.2 THE INTERNATIONAL TRADE REGIME**

The 'power' of the international trade regime relative to the conglomerate of MEAs that make up the forest governance system may be expressed as follows: "Judged in terms of size and teeth, we might regard the WTO as a large tiger and the MEAs as a ragged collection of small cats" (Eckersley, 2004, p. 24). According to the same author, this imbalance is mainly a result of differences in influence, outreach, financial backing and organisational structure. Most importantly, it seems to be a function of 'legal' dominance, i.e. whereas WTO members can challenge the coherence of MEAs with respect to basic GATT principles, signatories of voluntary, non-binding MEAs do not hold the same rights. Even more, Humphreys (2006) judges the WTO to have a neo-liberal orientation, and its dominance in the international arena of (non-)legally binding agreements to be of such a degree that it heavily influences the forestry governance systems, as texts here are written in a non-confrontational way to existing WTO regulations. Most commonly, authors refer to the influential force of the WTO as a "disciplinary" form of governance (Kirton & Trebilcock, 2004; Weber, 2001). As a result of the latter, negotiations and ultimately the written MEAs are thus often self-censored in order to avoid any potential breach with

existing WTO rules.

The basic principles of international trade are anchored in the GATT/WTO principles. With respect to the above, trade laws prevent member countries discriminating between products on the grounds of process and production methods. For instance, an import restriction due to silviculture systems, e.g. sustainable forest management, is unlikely to exist under the GATT. The most common trade barriers are tariffs, and more specifically in the case of forest products, cases of tariff escalation. This is because tariff rates for raw materials and simply worked products are close or equal to nil in comparison to increasing tariff rates for further processed wood products (Table 4-7). Imports to most OECD countries like wood panels, builder's woodwork and furniture are 'penalised' with import tariffs of up to 10%, compared to less than five percent for primary processed products (Fern, n.d.; Katila & Simula, 2005; Rytönen, 2003; Sizer et al., 1999).

**Table 4-7** EU import tariff rates (2000, HS codes ad valorem, percent)

Code	Product	MFN	GSP	Code	Product	MFN	GSP
44.01	Chips and particles	0		44.09	Mouldings	0	
44.03	Log	0		44.1	Particleboard	7	5
44.07	Sawnwood (lengthwise)	0 (C)	0	44.11	Fibreboard	7	5
	sliced, peeled, or planed	0-2.5 (T)		44.12	Plywood	6-10	4.2-7
44.08	Veneer	3, 4 (C) 3-4.9 (N)	0	94.03	Furniture of wood	0-2.7	0

*Source:* Based on Rytönen (2003), originally adapted from Bourke and Leitch (2000)

*Notes:* When MFN rate is higher than the applied rate, the latter has been shown. Countries not eligible for most favoured nations (MFN) rate may face substantially higher rates. C=coniferous, N=non-coniferous, T=tropical, GSP = Generalised System of Preferences

**Table 4-8** Chinese import tariff rates (2008, HS codes ad valorem, percent)

Code	Product	MFN	General	Code	Product	MFN	General
44.01	Chips and particles (NC)	0	8	44.08	Veneer (T)	10	40
44.03	Log (T)	0	8	44.09	Mouldings (NC) (floorboards)	4	50
	Okoumé*	0	35	44.10	Particleboard	4	40
44.07	Sawnwood			44.12	Plywood (T)	12	30
	Sapelli (species)		40	44.18	Builders' woodworks	4	70
	Iroko (species)	0	14				

*Source:* Based on Rytönen (2003), figures adapted by data extracted from Import and Export Tariff by the Department of the Customs of the People's Republic of China (PRC, 2010)

*Notes:* \* Okoumé is exported extensively by Gabon and thus highlighted; General = General tariff rates shall be applied to any imported products originated from countries or regions with which no trade preferential agreement have been reached (...); C=coniferous, N=non-coniferous, T=tropical

Similar to OECD countries, tariff rates are not applied to logs exported to China. The reason for this is

twofold: China's accession to the WTO in 2001 and the strategic enablement of domestic processing industries to source raw materials from abroad needed in light of domestic timber shortages (AFPA, 2004; Cao et al., 2004; Rice et al., 2000). Contrastingly, tariff rates still apply to wood products, hence mirroring a situation of tariff escalation (Table 4-8). For most products the absolute tariff rates are higher than those set by the European Union stated in the previous table (Table 4-7), such as veneer and plywood, but not including particleboards where the Chinese import tariff rate is lower than that of the EU. It is also believed that the abolition/reduction of import tariffs in China goes hand in hand with other state measures to support the growth of processing industries (see Section 4.2), such as the relaxation of import permits, reduction on tariffs for processing machinery, financial and tax incentives to attract foreign investment, loans and loan subsidies, and value-added tax rebates for wood product exports (AFPA, 2004; Chunquan et al., 2004; Eastin, 2005).

In the absence of a coherent global governance system and/or a clearly identified international institution next to WTO trade regulations, the EU aims to create a network of voluntary, bilateral agreements with major producer and processor countries to combat the trade of illegal exploited logs and in support of the implementation of sustainable production methods in the South. In short, the Forest Law Enforcement, Governance and Trade (FLEGT) programme initiated by the European Commission attempts to enforce environmental regulations, including trade rules, that by-pass the otherwise dominating WTO legislation (John Humphreys, pers. comm., 2008). Furthermore, the existing frictions between the prevailing trade regime versus interests related to ecological and social concerns of international trade and production, next to the ambivalence of existing global MEAs, led to alternative forms of regulation such as third-party certification schemes (also considered non-tariff barriers to trade).

#### **4.4.3 NON-TARIFF BARRIERS TO TRADE**

Given the average low tariffs in tropical importing countries (though not necessarily in producer countries), it is common understanding that non-tariff barriers to trade are a greater obstacle for market access. A study by Choon and Ginnings on behalf of the International Tropical Timber Organization (ITTO) found that Southern producers consider "Factors other than tariffs ... more significant than either high ... or discriminatory ... tariffs" (1999, p. 70). This outcome was confirmed by another ITTO study undertaken six years later, which concludes that "producer member countries have expressed



concerns that evolving product standards and technical regulations in consumer markets are restricting the expansion and diversification of the international tropical timber trade” (Taylor et al., 2005b, p. 18; Tissari, 2009).

In general, technical regulations were drafted with the intention to protect human health and safety. For instance, products imported to the EU are often required to have the CE marking, signalling that the product complies with the essential requirements of the relevant European health, safety and environmental protection legislations (Table 4-9). In more detail, the European Committee for Standardisation has set emission levels of formaldehyde released from glues used in production process of construction products (Alavi, 2007). Moreover, phytosanitary requisites may apply to packaging and crating materials, as well as raw materials in order to prevent infestation of the importing environment with foreign pests and diseases (Sizer et al., 1999; Taylor et al., 2005a). Further technical regulations apply to secondary wood products and wood panels used in the construction industry, which requires products to conform with (European) building requirements such as fire codes.

**Table 4-9** Non-tariff barriers to trade in selected consumer regions

Consuming region	Non-tariff measures	Products affected
European Union	CE marking based on the Construction Products Directive*	Construction products
	SPS ISPM 15*	Packaging and crating lumber
	Government procurement policies favouring FSC-certification or any single standard	Especially wooden construction products
North America	Grade stamp certification	Sawnwood and panel products
	Phytosanitary measures ISPM 15	Wood packaging and crating material
	Government procurement policies favouring FSC-certification, or not using tropical hardwoods	All products used especially in construction
China	China has basically no tariffs or non-tariff measures (NTMs) affecting logs but they apply for value added products	Wooden furniture
	Furniture labelling scheme	

Source: UNCTAD (n.d.)

Notes: \* SPS = Sanitary and Phytosanitary, ISPM = International Standards for Phytosanitary Measures

Contrastingly, access to China, besides its tariff regulations applying to processed wood products, appears to be confined to a labelling scheme for wood furniture according to information presented by the United Nations Conference on Trade and Development (UNCTAD, Table 4-9). An absence of building codes and/or the failure to recognise existing schemes used in countries in the North, such as

the USA has led to deficiencies that “could potentially result in performance problems in wood frame buildings (e.g., earthquake performance and longevity). For example, in some cases, Chinese builders are using non-structural plywood in structural end-use applications ...” (Eastin, 2005, p. 4). Moreover, products in China have been found to be marked by counterfeit US and EU (CE) grade stamps (Cao et al., 2007; *ibid*).

Next, both third-party certification and labelling requirements are often regarded as significant technical barriers to trade, although these are most commonly enforced by non-state actors such as international NGOs. As Gulbrandsen (2004, p. 76) explains, “A forest certification scheme usually involves the development of prescriptive principles and criteria of SFM; accreditation of independent third parties (certifying bodies); forest management auditing (verification of compliance with rules for SFM); and product eco-labelling (tracing forest products through the supply chain)”. The necessity and time consuming documentation and verification process, as well as the continued operation of sustainable managed forests results in additional, high costs to producers, and thus are considered to disadvantage producers in developing countries. Furthermore, “Anecdotal evidence also confirms that certification schemes have also been used as a protectionist measure in some countries” (Alavi, 2007, p. 27).

It is clear that certification schemes like the Forest Stewardship Council (FSC) or the Programme for the Endorsement of Forest Certification (PEFC) are increasingly influential global standards, and that the rate of uptake is more concentrated in Northern industries. For example, Gullison (2003) reports countries’ forest certification rates to be as high as 52% for Estonia and 40% in each Poland and Sweden. The introduction to this chapter provided more generic numbers where an estimated 80-90% of all FSC certified forests are in developed countries. Partly because of the realisation of the obstacles for many developing country producers (lack of finances and skills) many environmental NGOs are concentrating their lobbying efforts and technical assistance programmes on a further push for the introduction of certification schemes in the South.

While certification schemes are still widely disputed with respect to their ‘WTO validity’, many European governments seem to have accepted it as a tool of their own purchasing requirements. In other words, governments in the Netherlands, the UK, and Denmark, to name just a few, issued

government 'green public purchasing' (GPP) rules, which aim to ensure the legality of forest products from sustainable sources, and which may accept certification schemes such as FSC as verification. Note that such GPPs are obligatory national regulations, whereas third-party certification by FSC, PEFC, and so forth are global, voluntary standards that can be endorsed by producers and processors. It is because of the latter that they are at times regarded as marketing tools for private industries. The FSC and PEFC schemes are in fact a product of collaborations between environmental and social NGOs, scientific institutions and private industry. "This varied group of people had in common that all had identified the need for a system that could credibly identify well-managed forests as [a] source of responsibly produced forest products" (FSC, n.d.-c), which led to the creation of third-party certificates endorsed by the industry/governments at large. It was also argued in Chapter 2 of this thesis that these networks of standards setting actors legitimise global standards to customers from the perspective of private industries.

#### **4.5 CHAPTER SUMMARY**

Countries with substantial tropical forest areas can be assumed to have a naturally given advantage in the production of wood raw materials. However, with the exception of Brazil and Indonesia, which are rich in forests and the top producers of tropical logs, countries' log production volumes cannot be determined by the given forest area alone. Contrastingly, wood supplies depend on countries' land usage, the rate of deforestation, forest access, as well as the intensity of species' utilisation and silviculture methods. Furthermore, significant entry barriers exist qua scale, investments (suppressed by the existence of illegally exploited logs in the international market), as well as technical and political factors. On a global scale, the supply of tropical logs is decreasing due to deforestation, residing resource needs from the North and increasing processing capacities in the South.

A number of countries, led by Brazil, Indonesia and Malaysia, developed significant wood processing industries that transform wood raw materials into products such as sawnwood, plywood and wood furniture. Similar to the extractive industries, substantial barriers to entry such as economies of scale, technology, skilled labour and investments seem to determine to a large extent not only the scale of processing activities but also which type of wood products are produced. In other words, in most developing countries there is often a dominance of sawnwood production due to relatively lower entry barriers. An important push for industrial upgrading came from the shift in processing activities away

from OECD countries to the South.

The change in the location of processing activities is a result of competitive pressures, i.e. lower production costs in Southern industries. Moreover, societal changes regarding the function of forests induced consumers of tropical products in the North to demand more stringent regulations attached to the import of tropical timber, e.g. through certification requirements, thus contributing to the decline of log imports to the OECD (next to increasing tropical log substitution possibilities). At the same time, forest management systems defined by the North are increasingly imposed through global standards on the South, i.e. producers of tropical timber need to demonstrate the application of sustainable silviculture methods, which usually reduces production and requires large investments by the producer.

A disruption to the global industry structure was brought about by the rapid development of processing capacities at an unprecedented scale in China, in the context of limited domestic supplies of logs. Chinese processing industries are now commonly referred to as the wood workshop of the world. Given domestic resource shortages, the demand for tropical logs by Chinese industries resulted in a shift of historic trade routes from producer countries towards China instead of OECD countries. The substantial volumes of tropical log imports to China are now a counterbalance to otherwise falling log imports requirements from the North. It was further shown that China is at an industrial stage of forest usage given its increasing (per capita) consumption levels of tropical logs feeding into growing domestic processing industries, its reliance on timber from natural forests, and its current non-sustainable procurement strategy.

With respect to the thesis' research focus both the declining resource needs and the outsourcing of processing activities by the North, as well as China's growing requirements of raw materials make it important to study the possible impacts on forest-rich countries like Gabon. The following chapter (Chapter 5) introduces Gabon, its national legislative forestry framework and its forestry industry. The subsequent chapter (Chapter 6) presents a formal analysis of discrepancies between Gabon's export markets based on an extensive discussion about standards and thus market access. Chapters 7 and 8 investigate how the organisation of Gabon's tropical timber value chain has changed due to the nature and scale of demand from China for tropical logs, as well as due to the possible influx of Chinese logging companies. The discussion proceeds with an analysis of the distribution of income to value

chain participants in Gabon, and a simulation exercise regarding the usages of domestic factors of production should Gabon export all its tropical logs to China or as processed wood products to Europe.

## CHAPTER 5 GABON AND ITS DOMESTIC FORESTRY INDUSTRY

The first part of this thesis presented the research context, namely China as the driver of the current commodity boom due to its impact on global commodity prices, and laid the theoretical foundations for our research concerning the disruptive nature of China regarding resource producers in the South. In order to test our hypothesis we identified tropical timber as a strategic natural resource to Chinese industries (Chapter 4). The same chapter documented a significant shift of tropical log trade flows away from OECD markets towards China. The change in established trade patterns is due to the resource-intensity of China's current economic growth pattern and due to developments of Chinese wood processing industries. Demand for tropical timber in China is sufficiently large to counterbalance falling log requirements from the North. Here, the pattern of consumption of tropical timber changed which is now increasingly in the form of processed wood products. This is a result of competitive pressures on processing industries in the North, substitution possibilities and environmental concerns.

The previous chapter (Section 4.1) also introduced tropical timber as a commodity with the potential for the establishment of processing industries in the South, and thus value-addition to a domestic resource, as demonstrated by Brazil, Malaysia Indonesia and Viet Nam. Their achievements regarding industrial upgrading, capacity expansions and skill developments are a consequence of the outsourcing of non-core activities by Northern producers, as well as of the increasing capacities and capabilities of Southern processors. Still, whilst some industries successfully exploited the opportunities provided by the structural changes in production, many other industries in developing countries seem to have failed to overcome domestic constraints in the form of technical, financial, skill-related and political variables. In these cases processing is often confined to the sawnwood sector with low barriers to entry (and thus a high degree of competition).

Recent decades saw Chinese industries follow the top 'tropical' developing countries' processing industries. Chinese processors are now often the world leaders in wood products ranging from primary ones such as tropical plywood to finished products like wood furniture. Given domestic resource constraints, industry growth rates are achieved through the importation of vast volumes of raw materials from the 'tropical' South. Chinese industries source a dominant share of their tropical log imports from five countries: Malaysia (31%), Papua New Guinea (21%), Gabon (13%), Myanmar (12%)

and Indonesia (8%)<sup>55</sup>. This chapter focuses on Gabon, as a representative of a Southern producer that still exports large volumes of unprocessed tropical timber. Gabon is hence affected by the often Sino-induced changes in the global consumption of tropical timber and wood products.

## **CHAPTER OUTLINE**

The first section of this chapter presents some country facts and the contribution of the domestic timber industry to Gabon's economy. The second section introduces key characteristics of the forestry sector with an emphasis on national legislation, i.e. forestry related policies, affecting the sector. This contributes to a discussion on external chain governance and its impact on the organisation of the domestic value chain in later chapters (Chapters 7-9) and on production profiles. The third and fourth section discusses Gabon's production profile over time each for logs and processed wood products respectively, taking into account both national factors and the fact that buyers determine the volume of production and the species extracted (evidenced in Chapter 6). Embedded in this discussion is an analysis of the trend of the 'tropical log' terms of trade of Gabon over time, as well as prices of exported tropical logs and wood products.

## **5.1 GABON AND THE TIMBER INDUSTRY'S ECONOMIC CONTRIBUTION**

During the write-up of this chapter in 2009, Gabon hit the headlines as president Omar Bongo Ondimba passed away after 41 years in office. Rising to power in 1967 through strong support from France<sup>56</sup>, Bongo installed a political system, where "the Franco-Gabonese elite ... exploited the natural resources of Gabon for their personal enrichment" (Colchester, 1995; Yates, 1996, 2008, p. 213). He thus developed a system of institutionalised corruption with luxury goods and company shareholdings being exchanged for political and economic favours (Wunder, 2003; Yates, 2008). Following 'elections' in September 2009, riots took place in disapproval of the president-elect Ali Ben Bongo, the late president's son, accused of electoral fraud, and in protest of France's alleged involvement in the election outcome (BBC News, 2009a, b, c).

### **5.1.1 INTRODUCTION TO GABON'S ECONOMIC LANDSCAPE**

Besides its political profile, Gabon is renowned for its extraordinary flora and wildlife, a major attraction for zoologists, bacteriologists and many more scientists. Furthermore, Gabon holds vast amounts of

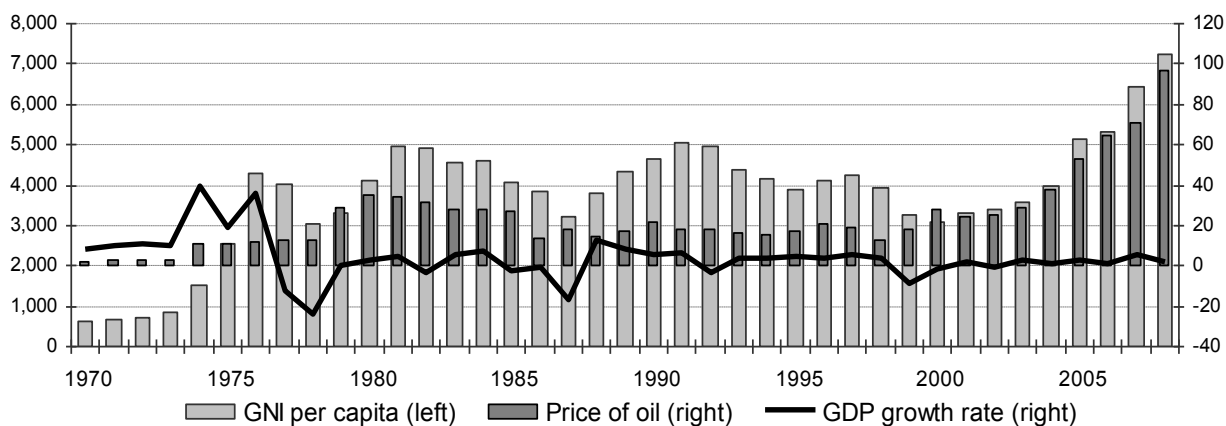
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<sup>55</sup> 2006 data extracted from Forestry Trade Flows by the Food and Agricultural Organization of the United Nations (<http://faostat.fao.org>) accessed July 2010

<sup>56</sup> From 1910 to 1959, Gabon was part of French Equatorial Africa and thus administratively ruled by France (Encyclopædia Britannica, 2009).

natural resources such as oil, timber, manganese, copper, as well as precious stones. Especially its oil resources have made Gabon a rich country with a gross domestic product (GDP) of US\$14.4 billion in 2008. Given the small population of 1.45 million, this translates into a per capita income of an estimated US\$7,240 in the same year<sup>57</sup>. Figure 5-1 displays Gabon's current GDP per capita and real GDP growth rate, as well as crude oil prices over the period 1970 to 2008.

**Figure 5-1** Real GDP growth rate (percent), GDP per capita (current USD) and crude oil prices (free market price, USD per barrel)



**Sources:** Data extracted from World Development Indicators by the World Bank (<http://data.worldbank.org>) and Commodity Price Statistics by the United Nations Conference on Trade and Development (<http://stats.unctad.org/CPB>), both accessed September and November 2009

GDP growth rates fluctuated greatly throughout the latter half of the 1970s and 1980s, yet seem to be more stable at around two percent after the last recession in 1998/99. Figure 5-1 also shows two major shifts in GDP per capita levels: one in the early 1970s and the second one in the early 2000s. Movements of both variables can largely be ascribed to fluctuations in the international oil market, i.e. crude oil prices, next to macroeconomic resource rent management and recent positive (stabilising) impulses from structural reforms (BFAI, 2008; Grau 2008; Söderling, 2006; Wunder, 2003). Price variations of commodities, particularly crude oil prices, are critical to Gabon as it largely depends on the oil industry for tax incomes and export earnings, for example, 82% of total export earnings are derived from the oil industry (OECD, 2009).

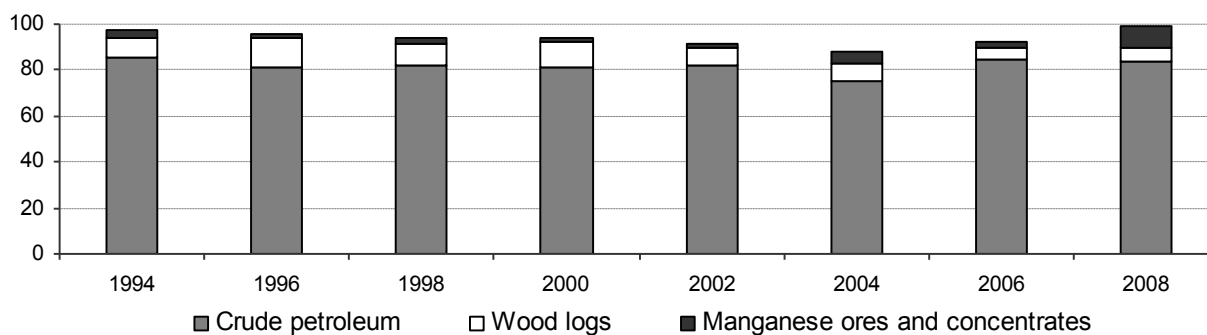
Since the discovery of oil in the mid 1960s, and particularly since 1973/74 when significant quantities began to be exported abroad, crude oil production levels were determined by international demand.

<sup>57</sup> Data extracted from World Development Indicators by the World Bank (<http://data.worldbank.org>) accessed September and November 2009.



Still, production peaked in 1996/97 as the major oil field has reached maturity<sup>58</sup> (BP, 2009; OECD, 2004). Despite falling production levels the oil industry is by far the dominant force in the economy, contributing 65% to total government revenue and slightly over 50% to GDP. Furthermore, crude oil made up more than 80% of total exports whilst the respective shares of other top exports are 9.4% for manganese and 6.2% for logs in 2008 (Figure 5-2). Because of its export structure, Gabon's Herfindahl export concentration index is relatively close to one with values of 0.73 in Dehn (2000) and 0.83 in Habiyaemye and Ziesemer (2006).

**Figure 5-2** Export shares of Gabon's top three export commodities (percent)

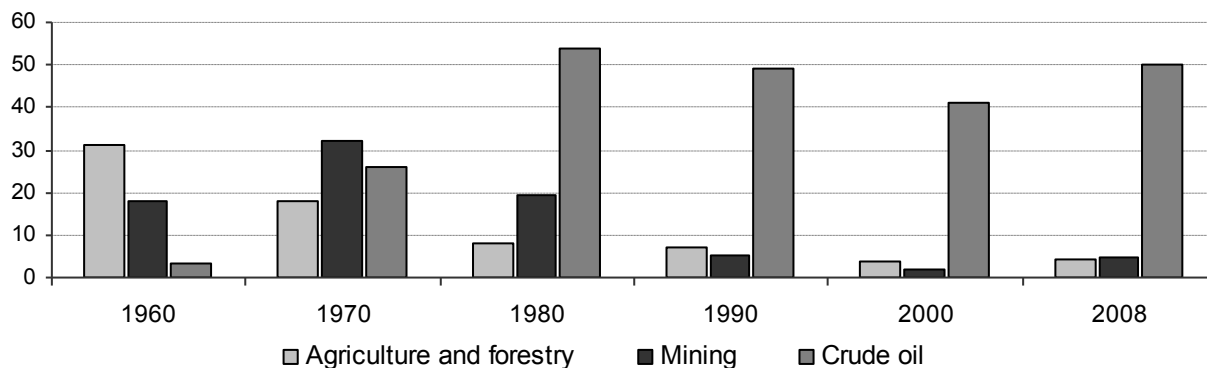


Sources: 1994-2006: Data extracted from UN Comtrade by United Nations Statistics Division (<http://comtrade.un.org>) accessed September 2009; 2008: Data extracted from OECD (2009)

The lack of economic diversification and strong reliance on natural resources has transformed Gabon into a rentier state. In other words, a country "that receive[s] on a regular basis substantial amounts of external economic rent" (Yates, 1996, p. 11), on which it relies for income rather than "domestic resource mobilisation or extraction of the domestic population's production" (Zafar, 2004, p. 10). The government has not been able (or willing) to manage these natural resource rents effectively, resulting in a typical Dutch Disease scenario. For instance, existing non-oil tradable sectors such as forestry, mining and agriculture contracted due to an appreciation of the real exchange rate, rising domestic production costs and resource transfers to the non-tradable goods sector in the 1970s, graphically displayed in Figure 5-3 (IMF, 2005; Leigh & Olters, 2006; Söderling, 2006; UNECA, 2003). The government also accumulated large amounts of debt due to unreasonable public expenditures and inefficient handling of trade shocks. For long, Gabon was not able to service its debt burden and contributions to its oil rent saving scheme (IMF, 2005). In January 2008, the government repaid around 86% of its debt, and is now considered to be independent of the Paris Club (OECD, 2009).

<sup>58</sup> High oil prices of the past years have triggered foreign investments into the exploration of new oil fields and more efficient production techniques. However, in spite of a possible increase of both the intensive and extensive margin of production, overall production levels continued to fall. Output is expected to continue to decrease over the next decades (BFAI, 2008; Grau, 2008; Söderling, 2006; World Bank, 2009; Zafar, 2004).

**Figure 5-3** Contribution to GDP of selected sectors (percent)



*Sources:* 1960-2000: Data extracted from UNECA (2003); 2008: Data extracted from OECD (2009)

*Note:* The figure shows relative, not absolute, shares of the strongest sectors, and thus serves as a proxy of the Dutch Disease effects on non-oil tradable sectors

Still, other symptoms include a very large government sector, which has significantly increased reservation wages, a high degree of urbanisation and weak entrepreneurial skills (IMF, 2005; Wunder, 2003). Furthermore, industries face infrastructure inadequacies such as poor road conditions and power breakdowns. The judicial system is described to be somewhat erratic and structural reforms, for example, the liberalisation of state-owned monopolies, have not improved the quality of services (BFAI, 2008; OECD, 2009). In addition, access to capital is often inadequate to foster domestic business investments, especially among small-to-medium sized companies (IMF, 2005). In general, entrepreneurs face a rigid labour market with constrained access to skilled labour, due to underinvestment in education and training (Grau, 2008).

Gabon's industries are further characterised by a dominance of foreign-owned transnational companies (TNCs), in particular French (oil and forestry sectors), as well as increasingly American (oil sector) and Chinese companies (Grau, 2008; IMF, 2005; Söderling, 2006). The presence of China and its influence on Gabon gained momentum through Sino-Gabonese cooperative projects and Chinese development assistance usually in the form of interest-free and/or concessional loans (Grau, 2008; Yates, 2008). A study by Alves (2008) estimated total transfers from China to Gabon to exceed US\$163 million between 2000 and 2008. Funds have chiefly been focused on infrastructure, resource extraction (mining and timber) and the construction of prestige objects.

The country's wealth was often spent ineffectively and in favour of the political elite, thus only partially trickling down to society. Whereas levels of extreme poverty were reduced substantially after 1960, poverty still affects parts of the population and inequality levels are high (OECD, 2004, 2009). The

richest 20% of society have around eight times the expenditure per capita power than the poorest segment (Table 5-1). Poverty rates are higher in rural areas but still average around 30% in cities, where the majority of the population lives (UNDP, 2005). Close to 20% of Gabon's population lives on less than two USD per day at 2005 international prices<sup>59</sup>. Gabon's poor overall social conditions are also reflected in other social indicators, such as life expectancy at birth estimated to be 57 years compared to the average of 51 years of Sub-Saharan Africa (UNDP, 2009).

**Table 5-1** Average expenditure per capita (EUR) and Gini inequality index by region (2005)

	Libreville	North	South	East	West	Aggregate
Average	1,470	880	810	1,110	1,300	1,220
Richest 20% (M1)	3,590	1,970	1,800	2,660	2,970	2,940
Poorest 20% (M5)	470	310	280	350	410	370
Ratio M5/M1	7.7	6.4	6.4	7.5	7.2	7.9
Gini index	0.42	0.41	0.44	0.46	0.42	0.44

*Source:* Data extracted from UNDP (2005)

*Note:* 1 XAF = 0.0019 USD (2005), 1 XAF = 0.001524 EUR (Irving, 1999; UN Key Global Indicators by United Nations Statistics Division (<http://data.un.org>) accessed December 2009)

### 5.1.2 ECONOMIC CONTRIBUTION OF THE FORESTRY INDUSTRY

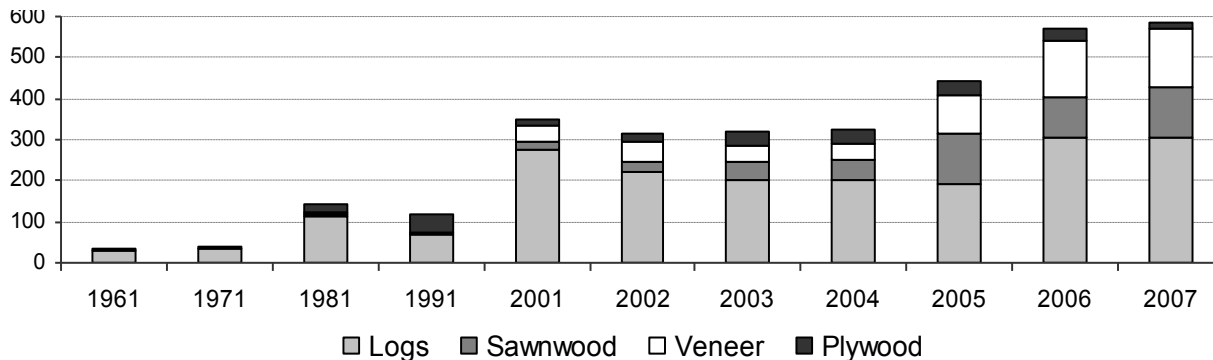
Before the rise of the oil industry in the 1970s, the forestry sector was a cornerstone of economic activities in Gabon (Forests Monitor, 2001; Makak & Mertens, 2009; Yates, 2008). Yet, due to the overpowering dominance of the oil industry throughout the last decades, as well as drainage of economic strength and public returns through rent-seeking activities within the timber industry, its contribution to GDP has been marginal, i.e. between one to two percent of GDP between the years 2000 to 2007 (OECD, 2003-2009). In comparison to neighbouring economies, in 2001 the value-added to GDP of the forestry sector in Gabon was around three percent but close to eight percent in the Central African Republic and seven percent in Cameroon in the same year (Melhado, 2007).

Although logs are the second most important export commodity of Gabon, the percentage share of wood logs in total exports is small (6.2%, see Figure 5-2). However, when one excludes crude oil from export data, wood and wood products in aggregate have an export share of nearly 56%, followed by manganese ore with a share of 21% and 8% of petroleum products. Thus, controlling for the oil-biased trade profile shows the prominence of wood and wood products in exports. With respect to export values, wood and wood products' combined trade value was close to US\$600 million in 2007, and

<sup>59</sup> Extracted from World Development Indicators by the World Bank ([www.worldbank.org](http://www.worldbank.org)) accessed August 2010

showed a clear upward trend (Figure 5-4), although is expected to have dropped in 2009 due to the recession (Box 5-1).

**Figure 5-4** Export value of logs and selected wood products (1961-2007, USD thousand)



Source: Data extracted from ForesSTAT by the Food and Agricultural Organization of the United Nations (<http://faostat.fao.org>) accessed November and December 2009

In contrast to the enclave oil industry, the relatively more labour-intensive timber industry is the second largest employer after the state (Makak & Mertens, 2009; Söderling, 2006). An estimated 28,000 to 32,000 people work in the forestry sector, thus absorbing 28-30% of the active, full-time labour force<sup>60</sup> (Kramkimel et al., 2005; Makak & Mertens, 2009). In 2003, it was further calculated that forestry employment primarily translates into employment in logging activities absorbing 70% of the total, compared to employment in the processing sector with a share of 30% (Odyssee Développement, 2005). The average monthly salary per type of employee is as follows (monthly wage stated in brackets): management (€5,700), senior technicians (€1,600), administrative staff (€700), labourers in extraction and processing (€300), transportation (€800), and staff for environmental and social issues (€600)<sup>61</sup>.

In the past, the timber industry was unregulated, because decrees of the previous reform in 1982 largely remained unwritten (Collomb et al., 2000), field monitoring was ill-enforced and became increasingly bureaucratized (Wunder, 2003), and foreign capital was privileged (Forests Monitor, 2001). These traits were also mirrored in the tax system, which is described to have been cumbersome and as having had poor collection rates. A comparative study by Collomb et al. (2000) shows that taxes in Gabon were also set at a very low absolute level as area taxes were between US\$0,006 and

<sup>60</sup> Data on informal employment and seasonal fluctuations in the timber industry are not in the public domain, but are likely to add to total employment figures. The employment distribution per sector is as follows (number of workers in brackets): state (60,000), forestry (32,000), oil (15,000), and extractive industries (10,000) (Kramkimel et al., 2005). Gabon's unemployment rate is currently at around 21% (OECD, 2009).

<sup>61</sup> Wages generally support five to six household members, though this number might be significantly higher in individual cases (Author's data collected Nov. 2008 to Feb. 2009).

US\$0.03 in Gabon relative to US\$2.5 and US\$4.2 in neighbouring Cameroon. Furthermore, tax evasion by private companies and individual concessionaries resulted in foregone revenues (IMF, 2005).

**Box 5-1** The impact of the current global recession on the forestry industry

Due to the global recession, starting in the summer of 2008, overseas orders for forest products dropped sharply, especially from European countries and North America for which producers describe a situation of almost complete market collapse. Contrastingly, orders from China and India stayed relatively more stable, though at the cost of decreasing prices. Log export prices to China dropped between 30-40% during the period 2008 to early 2009. For some species the fall in prices was even sharper, such as for Okan with an average export price of FCFA65,000 (€99) in early 2008 falling to FCFA33,000 (€50) in early 2009. Many companies expect profits to be close to, or below, nil for 2009.

As an immediate result of lack of orders, extraction of trees slowed down considerably and production fell by up to 70% for individual companies in Gabon. Some producers had to put all logging activities temporarily on hold. The same is true for processing units, where some sawmill owners completely stopped production. In cases where wood products were still produced, it was at a considerably lower absolute volume. In addition, employment levels started to fall as labourers were laid off. Though data are scarce, some companies reported that they reduced their workforce by half (January 2009).

*Source:* Author's data obtained during interviews with key stakeholders, producers and processors in Gabon during November 2008 to February 2009

It is unclear to what degree the timber industry receives contributions from abroad in the form of foreign direct investments (FDI), as financial and/or budgetary data are difficult to obtain from private companies (Author's observation). In addition, publicly available information does not define FDI according to sector. Yet, from the given data, one can conclude that the largest FDI inflows are directed towards the oil sector, and that major investments originate from France and the United States of America (UNCTAD, 2006). The recent inflow of Chinese FDI is linked to development assistance, often in the form of interest-free loans and turn-key projects, and is increasingly important to Gabon. It is targeted at the forestry and oil industry though more focused on investments in the mining sector (Alves, 2008; Jansson, 2009).

## **5.2 OVERVIEW OF GABON'S TROPICAL FORESTRY INDUSTRY**

For a long time, the export-orientated timber industry remained unregulated and out of the political limelight. Although the timber industry is the second largest employment sector, and wood raw material

is the second most important export commodity, other contributions of the timber industry to the economy have been limited. This has been because of non-existent or inadequate regulations and tax collection systems, industry barriers, as well as a lack of constructive political support in the past. Overall, the state did not make use of the sector's full potential to foster economic development and resource-based industrialisation, and the industry's focus remained firmly set on logging for overseas markets.

However, due to the growing pressure for economic diversification in the light of falling oil production the forestry sector has recently gained a higher degree of importance in the political agenda (Leigh & Olters, 2006; Söderling, 2006; Wunder, 2003). This renewed interest is manifested in a sectoral programme on forests, fisheries, and the environment (Programme Sectoriel Forêt, Pêche et Environnement)<sup>62</sup>, and in major reforms of the forestry sector. The latter included the abolition of the state-owned monopoly Société Nationale des Bois du Gabon, and hence the commercialisation of Gabon's dominant tree species (Box 5-2), as well as the introduction of a new legislative framework known as the Forestry Code, Law No 016/01 (Gabonese Republic, 2001). The focus shifted from raw material extraction towards the industrialisation of the forestry sector through increasing domestic processing before exports, as well as towards sustainable production methods (C. Besacier, pers. comm., December 2008, January 2009; O.P. Fremond, pers. comm., November 2008).

In current policy, the timber industry and economic gains extracted thereof are envisioned to be aligned with Gabon's poverty reduction policy (Document Stratégique de Croissance et de Réduction de la Pauvreté, Strategy Paper for Growth and Poverty Reduction), as well as to be better integrated into budgetary spending plans (Cadre de Dépense à Moyen Terme, Medium-term Expenditure Framework) (Makak & Mertens, 2009). Equally, rural communities are targeted to receive more benefits from the forestry sector through a wider network of linkages between villages located in logging companies' concession areas and the forestry industry. Lastly, the state placed a stronger emphasis on environmental protection with the creation of national parks of an area size of slightly more than three million hectares, or 10-13% of the total forested area (WCS, 2009; World Bank, 2009; WWF, 2002).

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<sup>62</sup> Sectoral Programme of the Forest, Aquaculture and the Environment

SNBG held the monopoly on the commercialisation of Okoumé and Ozigo between 1976 and 1998. It controlled the exploitation and exportation of these species by setting production quotas to foresters and by controlling all log exports. SNBG bought the logs at fixed prices and re-sold them to the global market with an average mark-up of US\$43 per cubic metre. While it charged a commission for its services of 7-10%, it simultaneously had the mandate to collect export taxes on behalf of the state. However, “as with comparable marketing boards, [... it made] large surpluses when demand and international prices peaked, while making heavy losses during market downturns, which the central government and forest companies were forced to absorb” (World Bank, 2005, p. 7).

SNBG was restructured into a Limited Company (state 51%, employees 6%, logging companies 43%) in 1994, but neared bankruptcy in the wake of the Asian financial crisis in 1997/98. As a result, the government was forced to allow the semi-liberalisation of trade to domestic companies (with processing units), though keeping control through export quotas set to producers. SNBG continued to face difficulties due to an expanded bureaucracy and a drop in global prices (late 1990s-early 2000s). As part of the state's efforts to restructure the forestry industry and because of external pressures from donor organisations, the export monopoly of SNBG was fully suspended in 2006, after a two-year phasing out period.

SNBG continues to operate but is in the process of diversifying its activities away from trading towards exploitation and processing. SNBG opened an overseas office in China, and “since 1982, it established solid business connections with Chinese economic operators [... who] are privileged partners in our strategy of development” (SNBG, n.d.-a, p. 2). Projects under this Sino-Gabonese partnership also include the construction of the Palace of the National Assembly, the Senate, the exploitation of iron ore (Belinga project), and the construction of a deep water port at Santa Clara.

*Sources:* Forests Monitor (2001), IMF (2005), G. Lalet (pers. comm., December 2008), S. Makaya (pers. comm., December 2008), SNBG (n.d.-a, b), World Bank (2005), World Bank & WWF (2002)

### **5.2.1 NATIONAL LEGISLATION AND KEY CHARACTERISTICS OF THE FORESTRY INDUSTRY**

The state is the sole owner of all forest ecosystems (§13, Law No 016/01). Thus, in order to gain access to forest resources for exploitation interested parties need to seek admission from the state, represented by the Ministère de l'Economie Forestière, des Eaux, de la Pêche et de l'Aquaculture (MEFEPA)<sup>63</sup>, in the form of logging concessions (MEFEPA, pers. comm., December 2008; February, 2009; Minnemeyer, 2002). In the past, the procedures of concession application and allocation were both vulnerable to corruption and non-transparent (Collomb et al., 2000; Forests Monitor, 2001). For example, concessions were at times assigned as political pay-offs to individuals, including government officials, who would then rent out the concession to a logging company for exploitation. This tenure

<sup>63</sup> Ministry of Forestry Economy, Waters, Fisheries and Aquaculture

system, also referred to as *fermage*<sup>64</sup>, is illegal but able to exist due to loopholes in legislation and toleration/enforcement by key decision-makers (J.P. Fines & E. Forni, pers. comm., November 2008; M. Ono, pers. comm., November 2008).

A new concessionary system was introduced in the wake of structural reforms in 2001 with the introduction of the Forestry Code. The present system aims to place greater emphasis on transparency by introducing a closed auction system to the allocation process, as well as by aiming to reduce the number of instances of corruption as a committee consisting of representatives from various Ministries are in charge of the allocation process (MEFEPA, pers. comm., December 2008; February 2009). Furthermore, applicants seeking to obtain a concession area(s) are now required to file a more extensive documentation than under the previous system (Law No 016/01 – Chapter I, Section 1; MEFEPA, pers. comm., February 2009).

Applicants provide the committee with two separate envelopes: one including a financial plan plus the bid price, and another one with technical notes such as a forest management plan (FMP) and a list of wood processing capacities (MEFEPA, pers. comm., December 2008; February 2009). The FMP has to specify the number of extractions on a yearly basis, the length of the applied rotation cycle, the annual areas specified for extraction, necessary access road infrastructure, and present an inventory of the forest stock within the concession(s) (Gabonese Republic, 2001; IMF, 2005). Processing capacities are documented by statements concerning the type and production capacities of existing (plus proposed) processing units. Only given the approval of all technical requirements, especially the proposed forest/logging management system, is the highest bidder awarded with the concession(s) (MEFEPA, pers. comm., December 2008, February 2009). Theoretically, future concession allocations will hence depend on the forester's management skills and style (i.e. sustainable forest management (SFM) compared to the old system (Méthode Okoumé, see below) and the company's ability to process raw materials domestically.

The post-Forestry Code concessionary system introduced in 2001 further includes new types of concessions, where concession areas that had been awarded before the reform also need to be

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<sup>64</sup> The literal translation of *fermage* is tenure or lease, but in Gabon it is used to explicitly describe the agreement between individual concession holders and companies, where the former receives a rent from the latter for access to his/her forest resources.



converted into one of the three new types of concessions (Chapter II, Section 1, Law No 016/01; MEFEPA, pers. comm., February 2009; Makak & Mertens, 2009):

CFAD: Concession Forestière sous Aménagement Durable (Forest Concession Under Sustainable Management); Obligation of domestic processing, area size between 50,000 and 200,000 hectare (maximum 600,000 hectare), minimum length of one rotation cycle (not shorter than 20 years), open to nationals and foreign companies (no joint-ventures, etc required)

PFA: Permis Forestier Associé (Forestry Association Permit); Reserved for Gabonese nationals, not larger than 15,000 hectare when integrated into a CFAD concession or 50,000 hectare when managed individually, minimum length of one rotation cycle (not shorter than 20 years)

PGG: Permis de Gré en Gré (Permit upon Agreement); Reserved for Gabonese nationals, for local/rural consumption only

Moreover, should existing concession areas be in the phase of being converted into a CFAD concession, this transition can be officially announced to MEFEPA, which consequently assign the applicant company a concessionary holder status of

CPAET: Conventions Provisoires d'Aménagement-Exploitation-Transformation (Preliminary Agreement of Management Planning-Exploitation-Processing); After signing the agreement, the concession holder will have to deposit a forest management plan and all other necessary documents within three years to obtain a CFAD concession status

In 2008, around 32% of all assigned concessions had been awarded with a CFAD concession (Table 5-2). Around 44% of concession areas were in the transition stage, represented by their CPAET status. Nearly 24% of all concessions are still classified under the preceding system, most of which are owned by individuals including government officials (Author's data collected November 2008 to February 2009). The transition from the old concessionary system to the one defined by the Forestry Code entails a number of changes, like the necessity for companies to compile and deposit a forest management plan (plus to align their logging activities to this plan). As can be seen in Table 5-2 it also led to changes in the number of concessions, i.e. the number of permits. In more detail, the new system specifies the area size of each type of concession, which led companies to join their

neighbouring concession areas into blocks of between 50,000 to 200,000 hectares.

**Table 5-2** Distribution and area size of types of concessions (2008)

Type of concession	Area (hectare)	Area (percent of total)	Permits* (number)	'Old' permits** (number)
CFAD - FMP validated	3,401,000	25.3	10	86
CFAD - FMP deposited	914,000	6.8	4	39
CPAET - signed	5,978,000	44.4	34	247
Other concessions***	3,158,000	23.5	212	212
Total	13,450,000		260	584

*Source:* Data extracted from Makak & Mertens (2009)

*Notes:* \* Number of concessions in 2008 (merger of existing concessions plus additional ones assigned after the introduction of the Forestry Code); \*\* Number of concessions from which the current number of concessions re-grouped; \*\*\* PFA (Permis Forestiers Associés), PGG (Permis de Gré à Gré), PTE (Permis Temporaire d'Exploitation), PI (Permis Industriel), PZACF (Permis Zone d'Attraction du Chemin de Fer)

The legislative reforms aiming to diversify Gabon's economic landscape by supporting the forestry sector, specifically domestic processing activities, also meant a re-design of the existing tax system, where payments were reduced to five major tax categories: export tax, stumpage tax, area tax, tenure tax and export surcharges if applicable (§244, Law No 016/01). The new tax system aims to provide incentives for producers and processors of wood to apply sustainable management practices in their operations (MEFEPA, pers. comm., December 2008, February 2009). To give an example, the general area tax is FCFA600 (€0.92) per hectare but can be reduced to FCFA300 (€0.46) when the concession is sustainably managed (symbolised through a CFAD concession type). Next, export taxes (17% of log list price), considered to be phased out over the medium-run, only apply to wood logs but not to processed wood products (J.P. Fines & E. Forni, pers. comm., November 2008; IMF, 2005). Total revenues currently stand at FCFA33 billion, which is equivalent to around €50 million (Table 5-3).

Overall, the current phase of transition of the forestry sector is described as "anarchic" (Makak & Mertens, 2009, p. 6), as companies (with a heterogeneous capital background) are at different stages of converting their concession areas, and due to the new demands impressed on all actors of the forestry sector, for example, with respect to their forest management skills. Especially smaller (individual) concession holders are thought to be discriminated against compared to large (foreign-owned) companies (J.P. Fines & E. Forni, pers. comm., November 2008; ITTO, 2005a). The ITTO further asserts that there are "... signs of fatigue, [and] constraints start emerging, which act as many hindrances for the process and its momentum" (2005a, p. 7). Industry experts interviewed during

fieldwork frequently mentioned that rent-seeking activities (e.g. the payment of bribes) still exists at all levels of administrative institutions and within the forestry industry<sup>65</sup>.

**Table 5-3** Forestry sector tax revenues (XAF and EUR million)

	2003	2004	2005	2006	2006 (million €)
	<i>(million XAF)</i>				
Export taxes	29.9	22.2	23.5	24.7	37.6
Stumpage taxes	2.6	3.6	5.2	4.1	6.3
Area taxes	0.8	4.3	3.7	4.2	6.4
Other taxes*	0.6	0.4	...	...	...
Total	33.9	30.5	32.4	33.0	50.3
In percent of total revenues	3.2	2.7	2.3	2.1	-
In percent of total non-oil tax revenues	7.8	6.7	6.9	6.4	-
In percent of GDP	1.0	0.8	0.7	0.7	-

*Sources:* Data extracted from Melhado (2007), adjusted with data extracted from personal communications with MEFEPA (December 2008; February, 2009)

*Notes:* \* tenure tax and export surcharge; 1 XAF = 0.0017 USD (2003), 0.0019 USD (2004/2005/2006), 1 XAF = 0.001524 EUR (Irving, 1999; UN Key Global Indicators by United Nations Statistics Division (<http://data.un.org>) accessed December 2009)

## 5.2.2 EXTERNAL GOVERNANCE PRESSURES

Although the government showed an increasing commitment towards environmental protection and sustainable production of tropical timber, it is believed that the reform is equally a result of external pressures exerted by i) the International Monetary Fund (IMF) and the World Bank, the most important creditors to Gabon, as well as ii) European governments and organisations re-defining their perspective on the functions of forests as sources for timber and non-forest products, and thus forest ecosystems that should be managed sustainably (Forests Monitor, 2001; ITTO, 2005b; Makak & Mertens, 2009). As Wunder (2003, p. 30) remarks, “Forestry regulation in Gabon remained extremely weak until 1996, when a process of legal reform was initiated, mostly due to external pressures”. Thus, recent reforms in Gabon such as the introduction of the Forestry Code are believed to be predominantly a result of creditor’s influence on the government.

Gabon received total funds of US\$25 million from the World Bank, through their Natural Resources Management Development Policy Loan (US\$15 million), which “aims to improve the efficiency of natural resources management in Gabon, to increase its impact on poverty alleviation, to protect the environment, and to reduce the country’s dependence on declining oil resources” (World Bank, 2005, p. iii), and through its grant from the Global Environment Facility (US\$10 million) directed at national

<sup>65</sup> Sources are not stated upon request of the respondents.

parks (IMF, 2009). The World Bank cooperates with the International Monetary Fund, which signed a Stand-by-Arrangement with Gabon worth US\$113.6 million, with the goal to enable Gabon to achieve a diversification of its economic landscape and to privatise state-owned monopolies (Forests Monitor, 2001; IMF, 2009).

Another channel that is used to influence Gabon's legislative framework as well as practitioners on the ground is through overseas development assistance (ODA). Major donor countries and institutions are France and the European Commission (Information based on data extracted from the Development Co-operation Directorate (DCD-DAC) by the Organisation for Economic Co-Operation and Development (OECD), [www.oecd.org/dac/stats](http://www.oecd.org/dac/stats), accessed December 2009). Furthermore, Gabon receives contributions through the Congo Basin Forest Partnership (CBFP), whose objective it is to "[work] in close relationship with the Central African Forests Commission (COMIFAC), the regional body in charge of forest and environmental policy, coordination and harmonisation, with the objective to promote the conservation and sustainable management of the Congo basin's forest ecosystems" (Quote extracted from organisation's homepage, [www.cbfp.org](http://www.cbfp.org), accessed December 2009; C. Besacier, pers. comm., December 2008, January 2009; Chevalier, 2009).

With a few exceptions, it seems that in general ODA and loans are not so much targeted at industry actors, but that the focus lies strongly on environmental protection and sustainability through forest management standards. In short, the bulk of financial assistance is provided in support of forestry policy and administrative management at the state level. There are only few environmental NGOs in Gabon, like the Tropical Forest Trust (TFT), which assists private actors to obtain third-party certification audit (E. Ditsougou, pers. comm., November 2008, February 2009). Overall, the objective of both international institutions and non-governmental organisations is to promote a transition towards a more regulated and sustainable forest management system in Gabon, including the promotion of certification (C. Besacier, pers. comm., December 2008, January 2009; O.P. Fremont, pers. comm., November 2008). For instance, the World Resources Institute (WRI) states in a recently published report that "Over the past decades, Gabon has benefited from assistance of international organisations working in the fields of sustainable management of renewable natural resources and in promoting the practice of good governance initiatives in tropical forests" (Makak & Mertens, 2009, p. vi).

During interviews with key industry experts in Gabon more detailed reasons for organisations' focuses were given, such as that "EU companies are driven by the market, i.e. increasing buyer demand for certification, and by the EU-FLEGT programme, which seems to be heavily pushed in Central Africa through the European Commission" (M. Ono, pers. comm., November 2008; see also Section 4.4.2). Thus, while buyer preferences play an important role, currently "much [of the shift towards sustainable forest management systems] is due to government pressure like FLEGT and individual governments in EU countries [e.g. incentive loans and subsidies]" (C. Besacier, pers. comm., December 2008, January 2009). Hence, while the World Bank loan was perceived to be a 'normal' tool to shape the state and its functions according to Northern believes, e.g. transparency and democratic usages of resource rents, especially the European Commission and EU countries were singled out as the key drivers of sustainable management standards and certification.

### **5.3 LOG PRODUCTION PROFILE AND PRICE MOVEMENTS**

Nearly 85% or around 23 million hectares of Gabon's total land mass is covered with forests (FAO, 2007). These forests produce around 300 to 400 different tree species (IMF, 2005; ITTO, 2006). Owing to its large volumes in the natural forest stand<sup>66</sup> and fibre characteristics (see Box 6-1) the dominant commercial tree species is Okoumé. Next to Gabon (70-80% of the forest contains Okoumé), it only exists in comparatively smaller volumes in parts of Equatorial Guinea, Cameroon, and the Republic of the Congo (ITTO, 2006; UNEP & WCMC, n.d.). There are no perfect substitutes<sup>67</sup> for Okoumé (G. Moussu, pers. comm., January 2009; Wunder, 2003). Consequently, Gabon has a quasi-monopoly on the (natural) production of Okoumé (though not directly leading to price formation distortions, see Section 5.3.2).

Given the strong political and economic ties during colonial occupation and after independence, much of Gabon's economy was driven by French industry demands for resources. In fact, because of the 'politically' enabled access to Gabon's resources, in particular Okoumé, French domestic timber industries specialised in the processing of this species. Consequentially, Gabon's forestry sector applied the so-called Méthode Okoumé silviculture system, characterised by highly selective logging

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<sup>66</sup> Particularly in those areas close to the coast and hence with an easier access for logging companies than more isolated forest areas in the Northeast and Southeast of Gabon. Access to the Southeast for commercial industries has only been permitted with the establishment of the Transgabonese railway (1973 to 1986) running the length of Franceville to Libreville (Collomb et al., 2000; ITTO, 2006; Makak & Mertens, 2009; Wunder, 2003). Currently, only roads connect the 'virgin' forest areas in the Northeast to Libreville.

<sup>67</sup> A substitute is Meranti, which is a South-East Asian species.

activities and by a reliance on natural regeneration to secure future timber supplies (Collomb et al., 2000; Dykstra & Toupin, 2001; ITTO, 2006). Indeed, taking into account estimates of 12 different forest cover studies, Wunder concludes, “that net current loss over the last decade may actually have been close to zero ... for the entire period since 1970, there is likely to have been a minor net reforestation” (2003, p. 13).

Supplying logs principally to French processing industries resulted in concentration of logging activities to around 15 to 20 tree species, of which four to five were extensively traded (in annual volumes  $\geq$  20,000 cubic metres). To give an example, over two thirds of wood logs and 70% of exports were Okoumé during the period 1987 to 1996 (Collomb et al., 2000). Additionally, given these highly specialised (and exclusive) linkages between Gabon and France, it was the understanding that “creating markets for species other than Okoumé is difficult because it would require heavy investments from French processing industries” (Collomb et al., p. 20), as these would have to adjust their mills to inputs of different fibre characteristics accordingly. In short, in order to comprehend log production volumes (i.e. the production profile) over time one is required to consider the demand from the dominant buyer at a particular point in time.

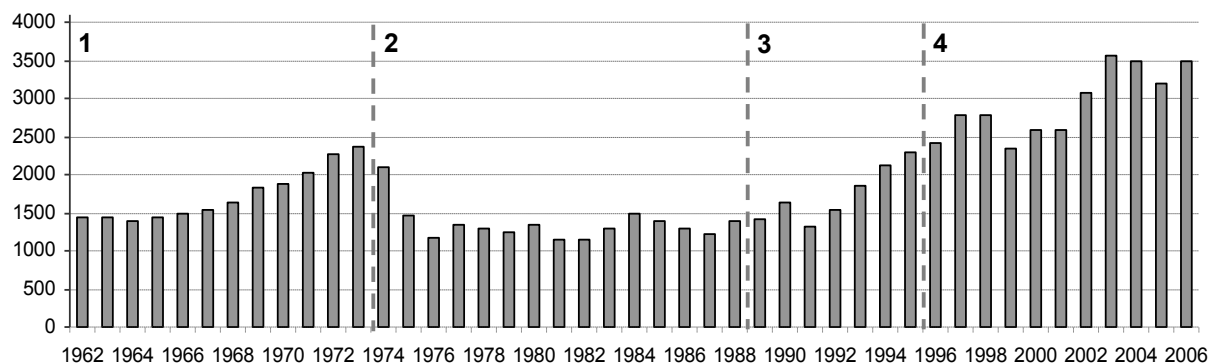
### **5.3.1 LOG PRODUCTION PROFILE**

Figure 5-5 displays Gabon's production volume of tropical logs from 1961 to 2008. Marked through vertical lines in the same Figure are four numbered periods of production, each of which is characterised by a different combination of internal and exogenous factors with a significant influence on Gabon's log production. The first period between 1962 (the year from which data are available) and 1973 is defined by a steady rise in tropical log productions during a time when the forestry industry was strong and one of the major contributors to GDP (Section 6.1). The positive growth rates of production in these years were largely driven by France, whose global tropical log imports are displayed in Figure 5-6. During the 1962 to 1973 period, France imported as much as 80% of its total imports from Gabon. Vice versa, Gabon exported on average 70% of its total exports to France<sup>68</sup> in the same time interval. Overall, as France's imports of tropical logs rose, so did Gabon's export volumes to France and hence its productions (given an insignificant domestic market and low industrial consumption rates for processing).

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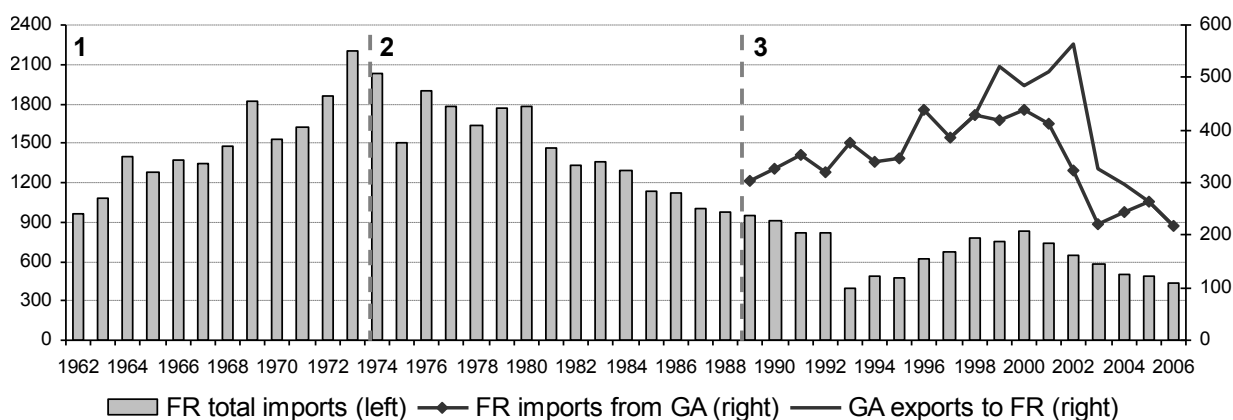
<sup>68</sup> Data extracted from FPTF by the European Forest Institute (EFI) (<http://www.efi.int/databases/fptf/>) accessed July 2010 (note that FAO does not publish trade flow data prior to 1997).

**Figure 5-5** Gabon's log production volume (CUM thousand)



Source: Data extracted from ForesSTAT by the Food and Agricultural Organization of the United Nations (<http://faostat.fao.org>) accessed November and December 2009, and July 2010

**Figure 5-6** France's global log imports and France-Gabon log trade (CUM thousand)



Sources: Data extracted from ForesSTAT and Forestry Trade Flows by the Food and Agricultural Organization of the United Nations (<http://faostat.fao.org>) accessed November, December 2009 and July 2010; and from Collomb et al. (2000)

Disruptions to this pattern of production were heralded by changes in France's resource demands and the negative impact of Gabon's expanding oil industry. Beginning with the oil boom in the early 1970s, particularly in 1973/74 when export quantities surged (Data extracted from Wunder, 2003) the total quantity of extracted logs fell by around 50%<sup>69</sup>. In more detail, due to Dutch Disease induced exchange rate movements as well as rising production costs, the sector became less competitive globally (IMF, 2005; Leigh & Olters, 2006; Söderling, 2006; UNECA, 2003; Section 5.1). Consequently, total log production volumes dropped from their peak level at about 2.4 million cubic metres in 1973 to below their early 1960s level of about 1.2 million cubic metres in 1976. The industry's contraction was further

<sup>69</sup> Data extracted from ForesSTAT by the Food and Agricultural Organization of the United Nations (<http://faostat.fao.org>) accessed November and December 2009, and July 2010

accentuated by declining resource needs from France mirrored in a continuous downtrend trend of tropical log imports since 1973<sup>70</sup>.

According to trade data extracted from the European Forest Institute (<http://www.efi.int/databases/fptf>, accessed July 2010) France's imports from Gabon fell in tandem to subsiding French log requirements until 1988. Over this period, France sourced a relatively constant share of roughly 34% of its imports from Gabon. Yet, while production quantities of Gabon's forestry industry first declined, they remained more or less stable at around 1.3 million cubic metres for the second half of the 1970s and 1980s. Although this is a lower absolute level than before, it seems that the relative decline in the importance of France as a trading partner (i.e. on average 55% of Gabon's total exports were then directed towards France) was balanced by exports to new importer countries. A brief analysis of Gabon's export partner countries and regions reveals that other European markets, such as the Netherlands, Portugal and Italy, countries of the Middle East (e.g. Israel), Morocco, as well as Asian trading partners (Japan) all traded with Gabon (Table 5-4). Nevertheless, none of Gabon's other export partners could match the volume requirements of France. It can hence be concluded that France was the main driver of Gabon's production profile.

**Table 5-4** Selected importer countries/regions of Gabon's log exports (Okoumé/Ozigo, CUM thousand)

	1989	1990	1991	1992	1993	1994	1995	1996	1997
Countries									
France	302	326	352	319	377	341	345	348	464
Morocco	79	88	93	95	116	114	93	80	109
Israel	162	203	182	202	197	187	143	97	105
Turkey	24	103	122	139	150	57	97	102	129
Japan	130	75	26	89	252	291	327	286	127
<i>sub-total</i>	<i>697</i>	<i>795</i>	<i>775</i>	<i>845</i>	<i>1,092</i>	<i>990</i>	<i>1,005</i>	<i>913</i>	<i>935</i>
China			12	36	143	242	364	627	1,016
Regions									
Europe	485	488	372	428	479	429	438	440	731
Africa	139	156	107	117	136	139	113	102	134
Middle East	202	309	307	345	351	256	244	200	234
Asia	140	87	41	127	494	634	915	1,098	1,580

Source: Collomb et al. (2000, p. 38)

Furthermore, lack of physical infrastructure to access new forest stocks as well as export control by and high commissions to SNBG restricted the expansion of exports (specifically to further

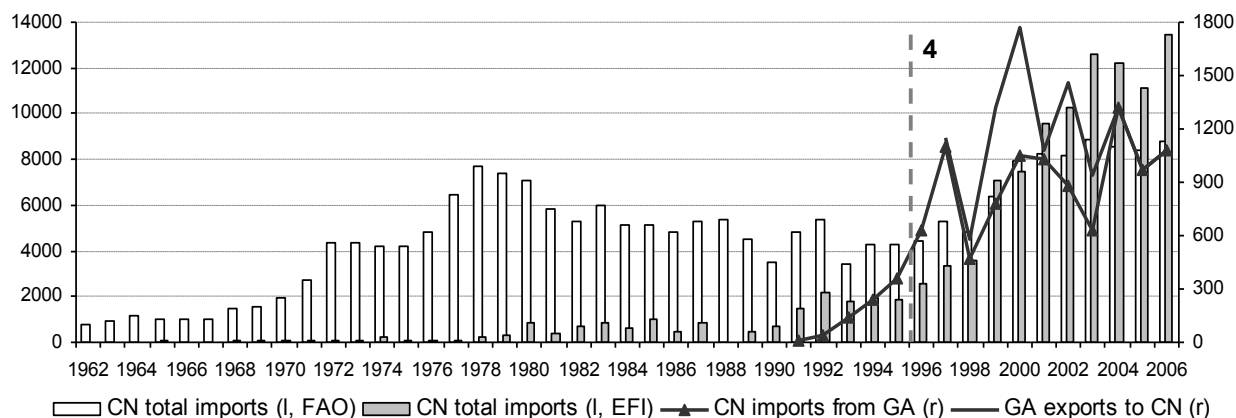
<sup>70</sup> A correlation between exchange rate movements and France's immediate drop in imports from Gabon might have existed over the short-run (Wunder, 2003).



counterbalance falling log demands from France) and thus production throughout this period (Collomb et al., 2000). This situation started to change with the reversal of demand from France around 1988 (Figure 5-6), thus marked as the third period of production, and declining oil revenues. The latter caused a real depreciation of the Central African franc against the US dollar between 1990 and 1994, making the timber industry more competitive globally (Wunder, 2003). As a result, log production levels approached the two million cubic metres mark, or approximately the level of production of the early 1970s (Figure 5-5).

From before 1962 until the mid 1990s (periods 1-3), France remained the dominant export partner for Gabon, next to Japan, other EU countries and Israel. However, as of 1995 China emerged as an importer country with significant weight resulting in the fourth period of production. Export volumes to China grew rapidly from a very small base of around 12,300 cubic metres in 1991 to around one million cubic metres in 1997 (Figure 5-7, Table 5-4). For Gabon, these one million cubic metres of logs represented an additional demand for tropical logs, whose quantitative level had never been reached before by its traditional key importers. In fact, starting around 1995 total log volumes traded with China were larger than France's imports from Gabon for the first time (Table 5-4).

**Figure 5-7** China's global log imports and China-Gabon log trade (1962-2006, CUM thousand)



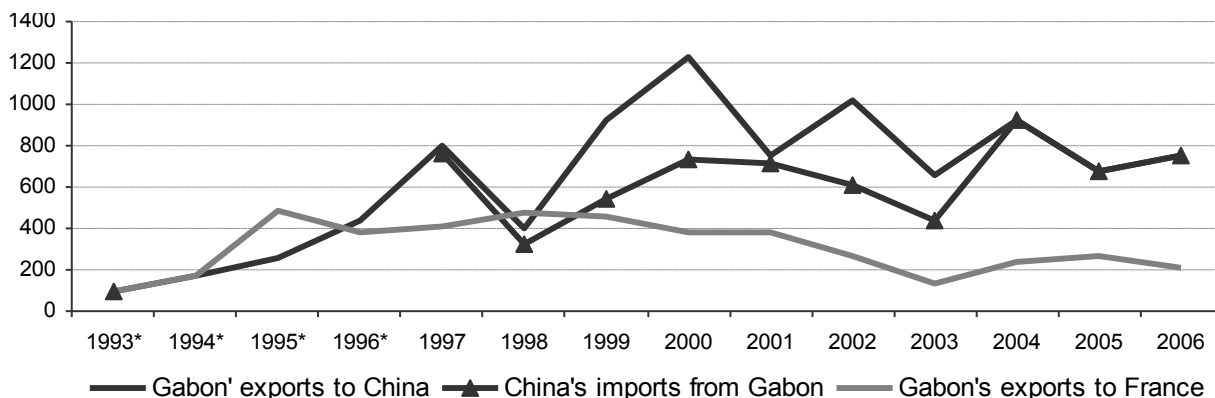
**Sources:** Data extracted from ForesSTAT and Forestry Trade Flows by the Food and Agricultural Organization of the United Nations (<http://faostat.fao.org>) accessed November, December 2009, and July 2010; from FPTF by the European Forest Institute (EFI) (<http://www.efi.int/databases/fptf/>) accessed July 2010; and from Collomb et al. (2000)

**Notes:** EFI data included for reference as these substantially deviate from FAO data (which is not the case for France); (l=left) and (r=right) in legend entry indicate the respective y-axis for each variable

Exports to China (imports from Gabon) rose by a staggering 9,200% in the initial years, i.e. between 1993 and 1997, and by an impressive 8,650% during the period 1991 to 2006 (Figure 5-8). The impact

of Chinese demands was reflected in Gabon's log production volumes with log quantities increasing above 2.5 million cubic metres annually for the first time in Gabon's forestry history (Figure 5-5). Whilst in the past the dominant share of total exports from Gabon were destined for France, China received up to 77% of total log exports (in 2004) and around 60% in recent years (data extracted from ForesSTAT and Forestry Trade Flows by the Food and Agricultural Organization of the United Nations, <http://faostat.fao.org>, accessed November, December 2009 and July 2010). In contrast, exports of logs to France fell by 56% during the years from 1995 until 2006 (Figure 5-8).

**Figure 5-8** Gabon's log export index to China and France (1993 = 100)



*Sources:* Data extracted from ForesSTAT and Forestry Trade Flows by the Food and Agricultural Organization of the United Nations (<http://faostat.fao.org>) accessed November, December 2009 and July 2010; and from Collomb et al. (2000)

*Note:* \* Indicates data extracted from Collomb et al. (2000)

Next to Okoumé, an increasing number of other hardwoods are now being exploited due to Chinese buyers' preferences (see Chapter 6). When France was the dominant trading partner the number of species exported in significant volumes was between four or five (Collomb et al., 2000). Applying the same threshold to a more recent dataset, the number of extensively traded species climbs to at least 14 (in 2008) of annual volumes equal to or larger than 20,000 cubic metres (Table 5-5). Conversely, the share of Okoumé in exports decreased from 70% in the period 1987-96 to 49% in the year 2009 (Data extracted from SEPBG, 2009). Although China was the key initiating force for the exploitation of a wider range of species, it seems that these species are now also bought by European markets. In 2008, the EU on average imported 41% of Okoumé and 59% of other hardwoods compared to a distribution of 53% and 47% respectively for Chinese imports. The share of Okoumé exports to France was 52%, which is a major change compared to the past, where the French processing industries' concentrated demand for Okoumé exclusively determined Gabon's exploitation activities and forest management system.

**Table 5-5** Export volume for selected species (CUM thousand)

	2000	2001	2002	2003	2004	2005	2006	2007
Okoumé	1,665	1,483	1,233	1,100	829	785	820	1,008
Ozigo	62	25	10	11	20	30	42	57
Okan	13	9	8	15	24	54	192	152
Padouk	124	114	121	109	107	129	113	151
Kevazingo	87	86	77	51	51	59	56	63
Tali	29	27	19	21	17	31	46	56
Moabi	56	73	54	54	62	57	44	48
Beli	37	47	49	32	30	21	42	40
Azobé	40	38	33	30	33	29	32	34
Miscellaneous	0	2	13	0	6	11	11	31
Andoung	15	2	2	3	6	18	24	29
Movingui	36	34	28	34	26	33	20	25
Bilinga	36	19	22	14	14	16	26	23
Douka	31	36	26	25	23	18	16	20

Source: Data extracted from SEPBG (2009)

China is known to import large volumes of illegal logs. However, it is our believe that whilst Gabon is no exception to China's sourcing pattern, almost all logs are being recorded at customs despite their likely 'illegal' origin (e.g. logs that are below the minimum log diameter of 70 centimetres or for which taxes have only been insufficiently paid). This conclusion rests on interviews with industry experts, NGO staff and representatives of logging companies in Gabon. To give an example, one respondent explicitly pointed out that SNBG buys logs for exportation that fail to reach girth specifications laid down in the Forestry Code. Yet, once such logs are 'rubber stamped' by SNBG, they enter trade without further questioning. As a result, both legal and illegal logs are thought to be recorded in trade records and thus should appear in trade statistics. In intervals log volumes reported by Gabon as exports to China and log imports from Gabon reported by China are similar. Nonetheless, discrepancies exist (displayed in Figures 5-6/7) that may or may not be a sign of trade with illegal logs.

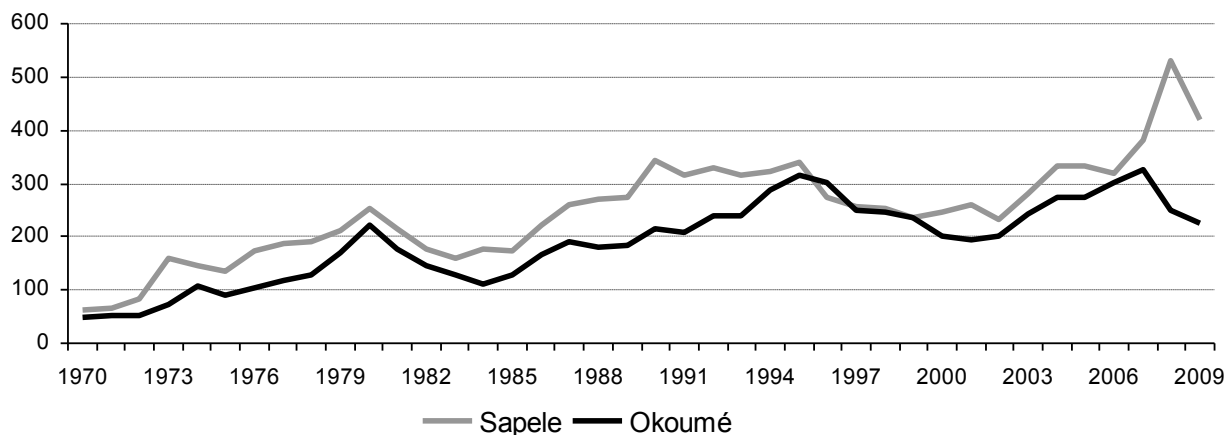
### 5.3.2 TROPICAL LOG PRICES

Although there is no transparent price discovery mechanism, price series for selected species are used to reflect global trends. Prices of tropical logs show an overall upward trend over time (Figure 5-9). For instance, the cubic metre price of Sapele (also called Sapelli) and Okoumé logs increased each by on average six percent annually between 1970 and 2006. The free market price of Sapele fell by around 20% between 2008 and 2009, and that of Okoumé by over 30% between 2007 and 2009, due to the drastic decline in demand linked to the current recession. In general, price movements of tropical

timber reflect the situation of global demand and supply (Section 4.1). For example, Ingram (1993, p. 1) writes, “Primary tropical forest products, such as logs and sawnwood, have decreased in supply as producer countries exercise various export restrictions to protect resources and develop domestic industries (ITTO 1990)”. Global consumption of tropical timber increases with population and economic growth, and is thus projected as rising over time (see e.g. Apsey & Reed 1995; Sedjo & Goetzl, 1997; Sedjo & Lyon, 1996).

The price development of Okoumé logs from Gabon (which increased by 554% over the period 1970-2007, Figure 5-9) reflects international trends. For example, prices rose sharply in 1993/94 due to buyers’ perception of log shortages in Asia, after which they returned to a more ‘normal’ level (as Malaysia lifted its export ban thus signalling a rise in supply), before declining relatively more pronounced at the end of the 1990s due to the Asian Financial Crisis and the related economic downturn. The fall of Okoumé (and global) log prices reversed in 2001. This was due to disruptions in African log supplies (e.g. civil unrests in Côte d’Ivoire and Liberia), shipping bottlenecks and rising freight costs, an increase in taxes in some producer countries including Gabon, as well as due to a general improvement of consumer confidence and the global economic situation (IMF, 2005; World Bank, 2005). Most importantly, increases in the 2000s (until the current recession) can also be attributed to steeply rising demand from China (see also Section 5.3.1).

**Figure 5-9** Sapele and Okoumé log free market prices (USD per cubic metre)



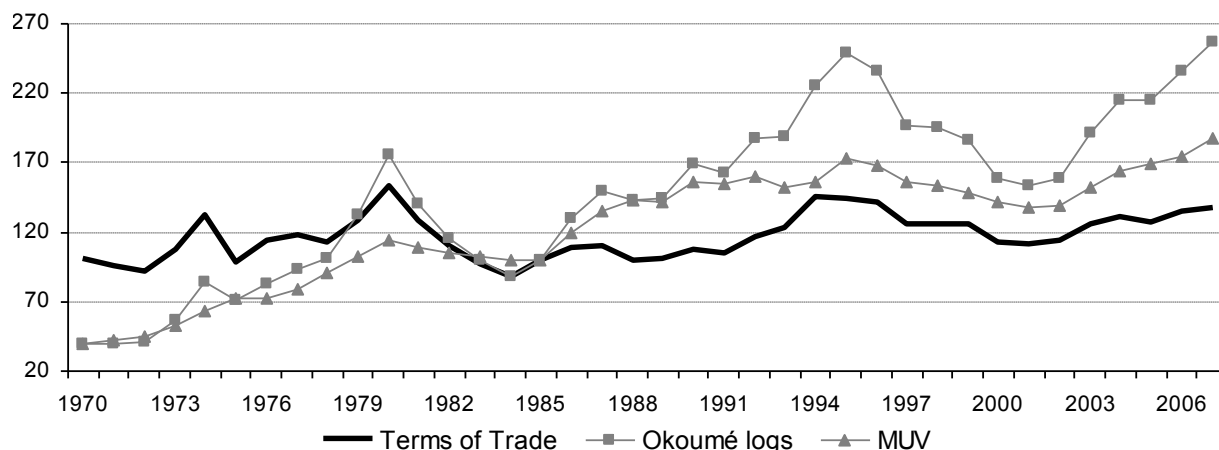
**Source:** Data extracted from Commodity Price Statistics by the United Nations Conference on Trade and Development ([www.unctad.org](http://www.unctad.org)) accessed November 2009 and July 2010

**Note:** Annual averages of free-market prices, Sapele: LM, U.K. import price, FOB; Okoumé: Gabon, superior quality, FOB

Moreover, Okoumé prices are likely to have increased as a reaction to total log supplies approaching Gabon’s physical maximum as both exploitation and transportation capacities, previously geared

towards a smaller French market, were fully utilised in the 2000s. There are two reasons for the constraint in log supplies. First Chinese demand increased, thus translating to higher production volumes and need for transportation. Secondly, the Forestry Code has a reported influence on production through the existing quota system (§238, Law No 016/01). In the words of interview partners in Gabon, “export quotas are limiting our production volumes” at the moment but it will also apply to “future production volumes”. Consequently, log supplies became more inelastic in Gabon, thus driving prices of Okoumé up when faced with increasing volume demands from China.

**Figure 5-10** Terms of trade, Okoumé log and manufacturing unit value indices (1985 = 100)



**Sources:** Data extracted from Commodity Price Statistics and Handbook of Statistics both by the United Nations Conference on Trade and Development ([www.unctad.org](http://www.unctad.org)) accessed November 2009 and July 2010

**Notes:** Okoumé log: Gabon, superior quality, FOB annual averages of free-market prices (USD/m<sup>3</sup>), MUV = Unit value index of manufactured goods exports (USD) by developed market-economy countries, Terms of trade = Okoumé log price index divided by MUV

In reference to the theoretical chapter of this thesis (Chapter 2), tropical log prices are not characterised by falling prices, which was one factor contributing to the historic deterioration of resource exporters' terms of trade. Instead, the overall rise of tropical log prices is regarded as a sign of increasing economic scarcity coupled with rising demand globally (see above). Scriciu (2007, p. 605) summarises the effect on the terms of trade by saying that “World prices for ... forest products are externally mediated macroeconomic factors. An increase in this variable due to, for example, increases in world demand for such products results in improved terms of trade for the exporting tropical countries”. However, the latter statement only holds true when the price of (manufactured) goods Gabon imports from the North increases disproportionately less than the rise of Gabon's log export price. Figure 5-10 depicts indices for Okoumé logs (exports), manufactured goods (imports), and the resulting terms of trade. Over the period 1970-2007 the terms of trade index improved from 100 points

to 137 (an increase of around 36%)<sup>71</sup>.

## **5.4 PROCESSED WOOD PRODUCTION PROFILE AND PRICE MOVEMENTS**

Next to logs, smaller volumes of primary processed wood products (ppwp) are being produced in Gabon namely sawnwood, veneer and plywood. Their share in overall production has been relatively low, averaging 11% for the period 1961-2007 (Data extracted from ForesSTAT by the Food and Agricultural Organization of the United Nations, <http://faostat.fao.org>, accessed November, December 2009). Gabon has thus for long focused its overall industry activities on the exploitation and exportation of logs. In comparison, data presented in Section 4.1.2 of this thesis showed that countries in Latin America and Asia have much higher domestic log consumption rates, i.e. in Latin America almost all logs are converted into primary processed products and in Asia this rate is at around 96%.

### **5.4.1 PROCESSED WOOD PRODUCTION PROFILE**

Despite Gabon's (and Africa's) relatively weak international position regarding domestic processing rates, there is an increasing demand from particularly European buyers for wood products (Section 5.2.1), which stimulated domestic productions since the mid 1990s, displayed graphically in Figure 5-11. With respect to sawnwood, exports rose beyond traditional levels as of 1997, after which it increased by 772% to its current standing (2007). A similar increase exists for export volumes of veneer, which increased by 303% between 1998 and 2007. Figure 5-11 further displays a modest increase in plywood exports as of 1998, reaching its peak in 2005, and then residing to its traditional level. In aggregate, the total processed wood product volume exported to the EU, converted into roundwood equivalents (i.e. the volume of logs required to produce the given wood product volumes) is now larger than the total log export volume (640,000 and 390,000 cubic metres in 2006 respectively).

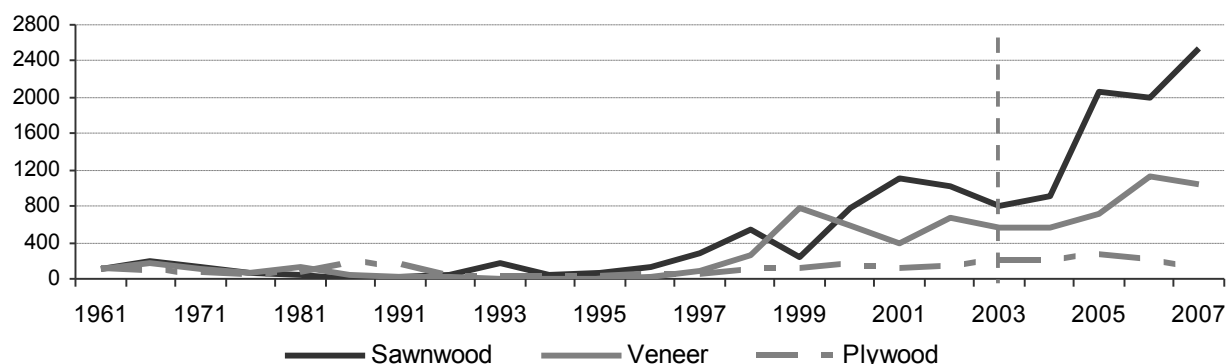
For the most part, production volumes of sawnwood can be assigned to demand increases of Gabon's dominant buyers. For example, Italy and France started to buy significantly larger volumes of sawnwood in the late 1990s, and the export surge in 2004 partly corresponds to Italy's and South

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<sup>71</sup> Note that real Okoumé log prices (i.e. nominal Okoumé log prices deflated by Gabon's consumer price index, retrieved from the African Development Indicators by the World Bank, <http://www.worldbank.org>, accessed August 2010) increased by about ten percent between 1984 and 2007. Real prices before the year 1984 fluctuated greatly and but overall declined by around 70% between 1974 and 1984. This was probably due to the Dutch Disease and linked to this pronounced changes in Gabon's real GDP growth rate, especially in the mid 1970s and again in the mid 1980s (see Figure 6-1).

Africa's increase in demand<sup>72</sup> (Figure 5-12). The same holds for veneer exports, which more or less move in line with buyer demands, especially from France and Italy (Figure 5-13). Low exports volumes of plywood throughout the 1990s are likely due to falling demand from France (57% between 1988 and 2005); while the mild increase thereafter corresponds to increasing demand from all three main buyers France, Italy and the Netherlands (Figure 5-14). The slowdown in exports since 2005 cannot be explained by the available trade data.

**Figure 5-11** Gabon's selected wood products export index (1961 = 100)



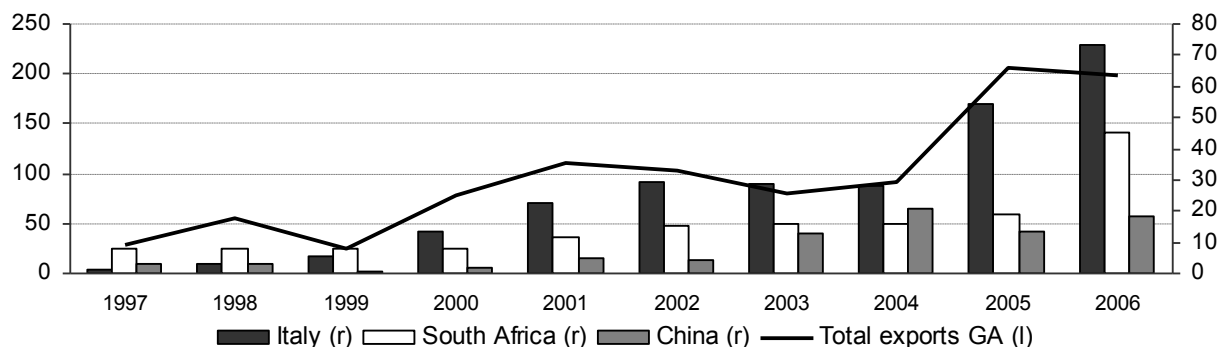
*Source:* Data extracted from ForesSTAT by the Food and Agricultural Organization of the United Nations (<http://faostat.fao.org>) accessed November, December 2009

*Note:* Vertical line marks the post-Forestry Code production period

Although there is a market demand for all three types of wood products, there is a more pronounced increase in low value-added sawnwood exports compared to veneer and plywood, where the latter production volumes have in fact started to fall as of 2005. This challenges current policy strategy, which favours domestic processing activities over the exportation of logs in general, but which should favour the production of veneer and plywood in particular, as these are activities further downstream along the value chain. Such a differentiation is absent in the Forestry Code, which stipulates that private industries' exports should generally be made up of 75% of processed wood products and only 25% of logs by 1<sup>st</sup> January 2012 (§227, Law No 016/01).

<sup>72</sup> Since around 2003, China has replaced France as the third most important export location for Gabonese sawnwood. Note that none of the other two wood products are exported to China, thus confirming our research result concerning Chinese buyers' demands and producers' export data (Chapter 5).

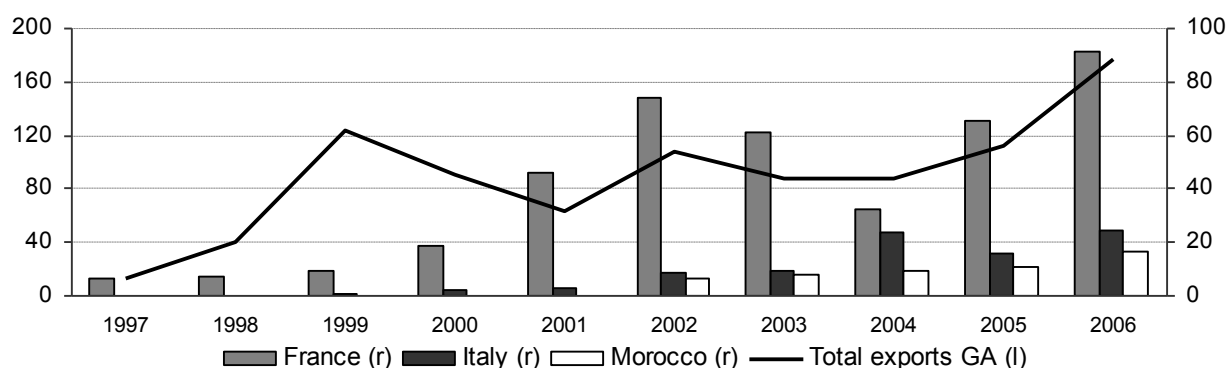
**Figure 5-12** Sawnwood: Gabon total exports and imports by top importers (CUM thousand)



*Source:* Data extracted from ForesSTAT by the Food and Agricultural Organization of the United Nations (<http://faostat.fao.org>) accessed November, December 2009

*Note:* (l=left) and (r=right) in legend entry indicate the respective y-axis for each variable

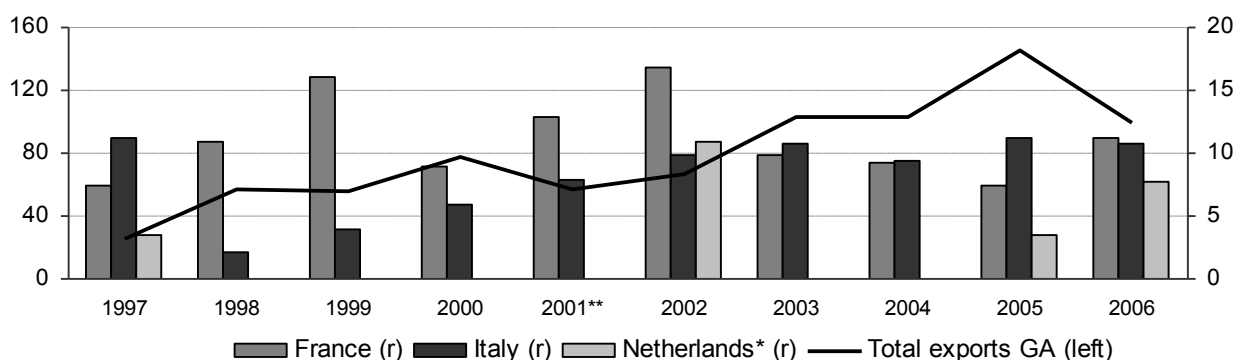
**Figure 5-13** Veneer: Gabon total exports and imports by top importers (CUM thousand)



*Source:* Data extracted from ForesSTAT by the Food and Agricultural Organization of the United Nations (<http://faostat.fao.org>) accessed November, December 2009

*Note:* (l=left) and (r=right) in legend entry indicate the respective y-axis for each variable

**Figure 5-14** Plywood: Gabon total exports and imports by top importers (CUM thousand)



*Source:* Data extracted from ForesSTAT by the Food and Agricultural Organization of the United Nations (<http://faostat.fao.org>) accessed November, December 2009

*Notes:* \* data only partially available, \*\*estimates; (l=left) and (r=right) in legend entry indicate the respective y-axis for each variable

Note that the Forestry Code was introduced in December 2001 but that a certain gestation period (of around two years) has to be considered before possible effects in the legislative framework are

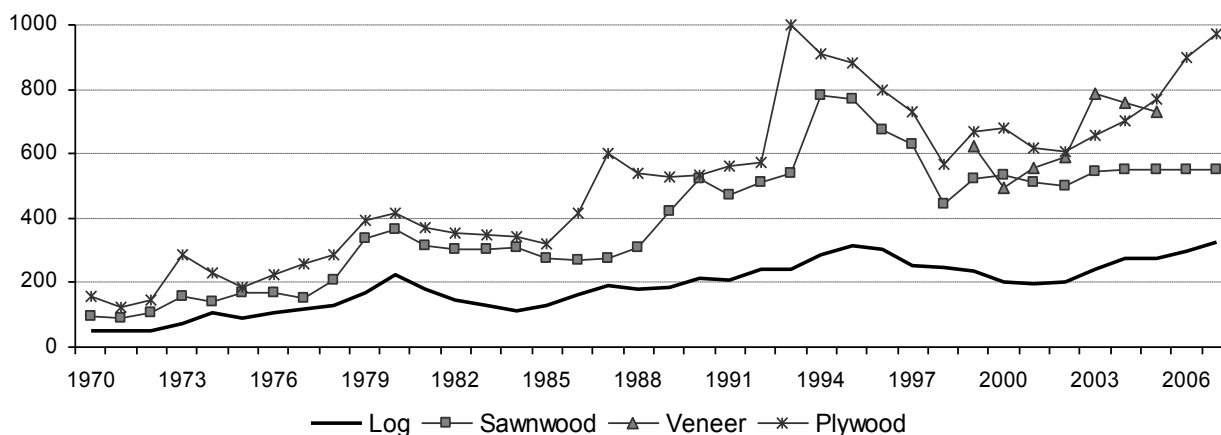


mirrored in the production profile (indicated by the dashed vertical line in Figure 5-11). The export of sawnwood between 2003 and 2007 (i.e. during the post-Forestry Code period) surged by 215%, increased relatively more moderate by nearly 90% for veneer, but declined by more than 40% regarding the export quantities of plywood. The determinants of the current product balance are discussed in the subsequent chapters (Chapter 6-8).

### 5.4.2 TROPICAL PRIMARY PROCESSED WOOD PRICES

The absolute price of the three types of processed wood products, i.e. sawnwood, veneer and plywood, are each higher than that of logs (Figure 5-15). This result could have been expected given that additional investments are made to transform tropical logs into each of the primary processed wood products. This progressive increase in price as raw materials are transformed into intermediate products is in fact a reflection of value-addition at downstream processing activities in a value chain. According to the available price data, the absolute price of plywood is higher than that of veneer, which is an input for plywood. Both the price of veneer and plywood are, in turn, higher than that of sawnwood, considered a basic transformation process. In comparison, Okoumé logs (unprocessed tropical timber) are at the lowest absolute price level.

**Figure 5-15** Primary processed wood product free market prices (USD per cubic metre)



**Sources:** Data extracted from Commodity Price Statistics by the United Nations Conference on Trade and Development ([www.unctad.org](http://www.unctad.org)) accessed November 2009 and July 2010, and from Dieter et al. (2006) for veneer

**Notes:** Log: Okoumé, Gabon, superior quality, FOB ( $\$/m^3$ ); Sawnwood: Malaysia, Dark Red Meranti, select and better, CIF French ports ( $\$/m^3$ ); Veneer: tropical non-coniferous, unit import value Germany ( $\$/m^3$ , converted into USD per cubic metre); Plywood: South East Asia, Lauan, 3-ply, 182cmx91cmx4mm, wholesale price, Tokyo ( $\$/m^3$ )

Yet, the assumed contradiction pointed out in the last paragraph, which noted a surge in exports of sawnwood relative to those of veneer and plywood, cannot be dismissed on the grounds of absolute

processed wood product price movements. In more detail, to be able to assess the possible impact of prices of wood products on the current production balance, price trends need to be compared with each other and those of logs. During the period between 1985 and 2007 prices of logs and sawnwood increased by close to 100% but those of plywood by more than 200% (Table 5-6). Yet, real prices of sawnwood increased by only 20% compared to an increase of around 70% of log and plywood prices respectively. The calculations were repeated for the years 2003 until 2007, previously identified as the post-Forestry Code period of production. During these years, the price increases for logs (35%) and plywood (48%) are far larger than those of sawnwood where the price remained almost constant. The nominal price of veneer decreased by seven percent over the time 2003-07, although real prices, adjusted for inflation, rose by slightly more than 20%. The differences between log and plywood price increases relative to those of sawnwood presided for real prices.

**Table 5-6** Price changes of logs and primary processed wood products (percent, selected periods)

	1970 – 2007**		1985 - 2007		2003 - 2007	
	nominal	real	nominal	real	nominal	real
Log	554	-11	96	69	35	28
Sawnwood	489	-20	99	18	1	4
Veneer			17*	11*	-7	23
Plywood	526	-21	206	72	48	41

*Sources:* Data extracted from Commodity Price Statistics by the United Nations Conference on Trade and Development ([www.unctad.org](http://www.unctad.org)) accessed November 2009 and July 2010, and from Dieter et al. (2006) for veneer

*Notes:* \* data cover the years 1999 until 2005; \*\* includes the period previously identified as being somewhat unrepresentative due to Dutch Disease effects experienced by the Gabonese economy in the second half of the 1970s until the mid 1980s, which is the reason for the inclusion of 1985 – 2007 data in this table

In sum, it is interesting to note that in Gabon sawnwood export volumes grew comparatively fast relative to other processed wood products, although export prices are lower and relative prices increased slower than those for plywood (and logs regarding relative prices). The fall in plywood productions, while considered a high value-added product from a global value chain perspective, has in fact dropped 2005. As with sawnwood, the export price and (relative) price trends of plywood exports do not seem to correspond, i.e. given its assumed high value-added (as well as high unit value) one would expect a sharper growth in exports. Similar discrepancies exist with respect to negative nominal price movements of veneer yet increases in export quantities. The need to explore the determining variables of Gabon's current processed log and wood product production profile in the previous subsection, i.e. influence of downstream buyers, has been confirmed by the discussion of prices in this

section.

## **5.5 CHAPTER SUMMARY**

The timber industry received little political attention in the form of supportive rules and regulations, and indeed contracted as a direct result of the dominance of the oil industry. It has also been documented that the forestry sector did not contribute significantly to government revenues. Contrastingly, rent-seeking, tax evasion, dubious tenure systems and corruption were wide-spread throughout the industry (and in some instances still exist today). The vacuum of a governmental framework, except for SNBG whose influence can be questioned in terms of industry support, was filled through France's demand for Okoumé logs for domestic plywood productions. French buyer requirements accordingly shaped the organisation and production profile of Gabon's timber industry, e.g. in terms of production volumes and mix of tree species. This also led the private industry to adopt a forest management system, which was geared towards Gabon's key market France.

This situation changed markedly at the end of the 1990s with the replacement of France as a key buyer through the relatively sudden and sharp rise in log exports to China. Log exports were soon much larger than traditional levels exported to Gabon's top importers. The entrance of China as a major importer of tropical logs has increased the production of raw materials in Gabon, and has resulted in the re-direction of most of Gabon's log exports away from traditional buyers towards China. Next, Gabon's exports show a different distribution of tree species due to Chinese buyer demands for previously 'non-commercial' trees. Recently, the European market has embraced the wider range of species as Okoumé features less prominently in European imports in recent years. In general, it can be said that the intensive margin of production has increased due to China's demand for large volumes of a wide range of species.

In addition, the initiation of an industrial support programme to achieve a greater economic diversification (apart from oil), and the subsequent introduction of a new forestry legislation further shaped the activities of the forestry sector. The Forestry Code directly impacts on producers' production quantities, the future mix of their forest product exports, their application process for revised types of concessions, their need to produce larger amounts of documentation, and producers' needs to adapt to a new management system in regards of sustainable production methods. Whereas there

seems to be a lot of activity among producers to formally (re-)apply and adhere to the new concessionary system, the situation on the ground has often been referred to as chaotic, or even anarchic, as both producers and MEFEPA try to adjust to the new legislative framework.

We thus identified several factors that have the power to affect the organisation and production/processing activities of the timber industry: i) China as the new key buyer, ii) European buyers, as well as iii) forestry legislation (Forestry Code). However, the previous sections also showed that iv) external parties, such as Gabon's creditors and dominant international organisations can directly (through technical assistance) and indirectly (through their influence on national legislation) influence the forestry sector. More specifically, a lot of financial and non-monetary assistance is directed towards the support of sustainable production methods, mostly through administrative changes. The desired changes naturally reflect external governors' objectives and overlap with the post-industrial attitude towards forests in the North, especially Europe, described in Chapter 4.

Still, while the presented data so far allow us to draw some preliminary conclusions, other discussions could not be closed to a satisfactory degree. For example, the current mix of exported wood products seems to be counterintuitive to both respective price movements as well as theory. The industry appears to have put its focus on lower-value added sawnwood production instead of higher-value added veneer and plywood. Moreover, there is a wide gap between total wood products production quantities' share in total exports compared to government targets, i.e. in 2007 wood products' share of total production volumes were 13% compared to the envisioned 75%<sup>73</sup>. The industry is far from achieving the 75% share in exports of wood products. Lastly, whilst data were presented evidencing an increase of the intensive margin of production, a similar discussion with respect to a possible outward push of the extensive margin is still missing. These topics, i.e. chain governance and margins of production, are explored in more detail in the following chapters (Chapter 7-8).

This chapter showed how the dominant buyers of Gabon's tropical logs and wood products shape the domestic production profile. In essence, foreign buyers thus determine the production volume, the type of species that are being exploited, and the specific wood products to be processed. Yet, there exist differences between China and the EU qua consumption patterns and their stage of forest usage, with

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<sup>73</sup> Data extracted from ForesSTAT by the Food and Agricultural Organization of the United Nations, <http://faostat.fao.org>, accessed November, December 2009

China currently being at an industrial stage compared to Europe that has entered a post-industrial phase (Chapter 4). Differences between the two markets were also pointed out regarding consumer awareness of environmental problems in producer countries and related to this the prevalence of non-tariff barriers to trade. The subsequent chapter (Chapter 6) presents a formal analysis of discrepancies in buyer-defined standards, namely i) firm-specific ones, ii) international regulations (including public standards) and iii) civil society standards such as sustainable certification schemes. The discussion is embedded in the global value chain concept of governance.

## **CHAPTER 6 CHINESE AND EUROPEAN BUYER STANDARDS AND MARKET ACCESS**

The previous chapter (Chapter 5) demonstrated that Gabon's production profile, specifically the volume and type of tree species, is a function of foreign markets. National legislation can play a significant role, too, in influencing the production profile. In addition, production and trade of tropical timber are influenced by national governance, various global industry and public regulations in the importing country, as well as civil society initiatives, the latter often regarding production and processing methods in the producer countries, in the absence of a coherent global forestry governance system (Chapter 4). However, earlier discussions (particularly Section 4.2/4) showed that an uptake of external standards by Chinese industries (specifically in tropical timber) is limited, as well as that the current Chinese national legislative framework does not address illegal logging. Generally speaking, and as is shown below, existing Chinese national purchasing policies do not discriminate production methods but rather focus on technical safety issues.

The existence of global standards and national regulations are a result of the vacuum in the global forestry governance system. In other words, the prevailing external governance structure has resulted in an increasing number of non-tariff barriers to trade. It is for this reason that producers in developing countries and industry experts/advocates often regard external standards as barriers to accessing foreign markets, and thus their ability to participate in international trade. Lead firms have to respond to external governance standards, like technical regulations and labelling/certification schemes, set by governments in the importing country and international organisations. This chapter provides a detailed account of three types of standards set by buyers in Europe and China to producers in Gabon.

From the perspective of the global value chain (GVC) framework introduced in Chapter 2, performance criteria set by lead firms are an expression of co-ordination of disintegrated production networks and trade. Here lead firms have the power to include or exclude suppliers that cannot conform to their standards. Lead firms are gatekeepers for access to foreign markets and dictate on what conditions market access can be achieved. An analysis of standards is hence embedded in a discussion about chain governance. A comparison of the standards set by Gabon's dominant export markets (represented by buyers in each market), allows one to draw conclusions with respect to changes in

value chain governance, i.e. a re-definition of chain governance due to the emergence of China as a significant consumer of tropical logs produced in the 'tropical' South like Gabon.

## **CHAPTER OUTLINE**

The first section of this chapter identifies the key procurers of Gabon's logs and wood products. The following second section discusses differences in chain governance on the basis of standards set by either or both the European and Chinese markets as reported by actors in Gabon. The analysis covers three groups of standards namely performance criteria set by firms, international (technical) regulations and standards formulated by civil society, where the latter two are conveyed to producer industries through buyers. In the third section, results derived from this analysis are compared to producers' abilities in Gabon to comply with specifically firm-specific performance criteria. The chapter concludes with a summary and points out consequential areas of analysis, which are going to be discussed in the subsequent chapters.

### **6.1 FIRST-TIER BUYER DIFFERENTIATION**

In producer-driven global value chains the driving co-ordinator of the respective chains are typically transnational manufacturers whose core activities are in technology- and/or capital intensive segments of production (see Chapter 2). Buyer-driven global value chains are most often found in labour-intensive industries like garments and footwear. Here the lead firms are usually final retailers or 1<sup>st</sup>-tier suppliers. For this thesis the analysis concentrates on the identification of 1<sup>st</sup>-tier downstream buyers of producers in Gabon (thus leaving the possibility that the inter-firm governance system might be different at nodes even further downstream in the value chain). During interviews with key industry experts, as well as both producers and processors in Gabon the following four types of buyers clearly emerged:

First, a considerable number of often independent traders (or intermediaries) operate in Gabon. They purchase logs directly from logging companies and individuals with access to the forest for processing companies in the importing country. These traders have their main office in Gabon, where they usually employ a small number of administrative staff. Secondly, there are traders with their main purchasing offices in the importing country such as representatives of import-export companies. These traders are permanently associated to a foreign company but undertake visiting trips to Gabon. This group of

traders purchases both logs and wood products for processing companies such as manufacturers of parquets, furniture, and plywood (China) and producers of furniture, doors, windows, staircases, plywood and floorings (EU), as well as construction industries (both China and EU)

Thirdly, wood and wood products from Gabon might be sold to wholesalers abroad from where both logs and primary processed wood products are most commonly transferred to primary or secondary processors respectively. Fourthly, Gabonese producers and processors might have direct links to processing companies in the importing country. There are cases where these foreign processors are in fact the operating centre of its subsidiary in Gabon. In addition, logs are sold from one logging company to another within Gabon<sup>74</sup>. The logs traded amongst domestic logging companies are in almost all instances exported abroad through any of the other four channels mentioned above. The sale of logs between logging companies is frequently undertaken, for example, in cases where a request for a specific species (mix) cannot be met solely from a companies' own standing volume. Logs are also sold to processing companies in Gabon. The output of processing companies in turn is exported to any of the four types of buyers discussed above.

## **6.2 EUROPEAN AND CHINESE BUYER STANDARDS**

The previous section identified four types of buyers, which largely procure logs and primary processed wood products for further processing industries such as those producing plywood, floorboards and furniture. Sawnwood might be consumed by the construction sector and thus is an input material into another value chain. Primary data retrieved for this thesis confirm information presented earlier (Section 4.2), which highlighted the various processing industries that consume tropical timber in China. Uniformity exists regarding the immediate consumers of Gabon's outputs as these are primary and secondary wood processing industries in the importing countries producing similar (intermediate) products. Given this homogeneity it is hence possible to compare groups of buyers with each other.

The following analysis pays tribute to the main 'driver' of standard formulation by differentiating between firm-specific performance indicators, international (technical) regulations (i.e. defined by public institutions such as government agencies and applying to the industry in general), and civil society standards that were set in full or part by private organisations like NGOs external to the value

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<sup>74</sup> In our sample and according to information obtained during interviews in reference to the industry in general none of the producers and processors procure wood products from another company in Gabon.

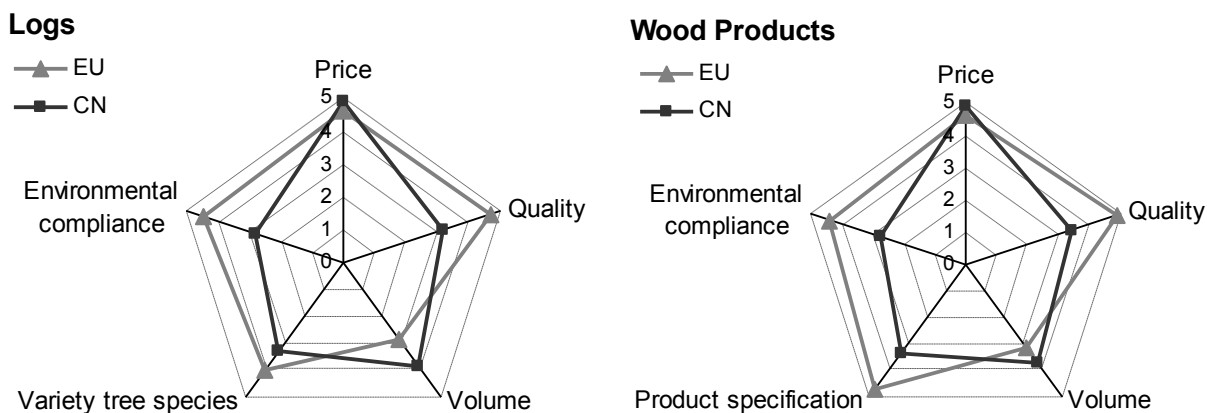


chain (see also Section 2.2). All three groups of standards, though defined by firms and different institutes external to the value chain, are assumed to be enforced by 1<sup>st</sup>-tier downstream buyers. In other words, consumer preferences and national regulations in the importing countries, as well as external global standards affect lead firms and thus are incorporated in buyers' purchasing decisions. Each standard is ranked on a five-point Likert-scale so that the degree of importance can be measured and compared for each European and Chinese 1<sup>st</sup>-tier downstream buyers in aggregate. Standards are differentiated between those applying specifically to logs or primary processed wood products.

### 6.2.1 FIRM-SPECIFIC PERFORMANCE INDICATORS

In direct comparison, European buyers are more demanding than their Chinese counterparts with respect to logs and wood products, as graphically displayed in Figure 6-1. The scale result of logs and those relating to wood products across the same group of buyers and variables show only minor differences. Furthermore, there is a smaller variance along the scale among European buyers' performance indicators relative to those of Chinese buyers. In more detail, a single variable is critical to Chinese buyers namely price. Volume is the second highest-ranked variable whose numeric value of four translates as important. Of moderate importance are the quality levels of logs and wood products, as well as the variety of tree species or product specifications for logs and wood products respectively.

**Figure 6-1** Firm-specific performance indicators (1 = not important, 5 = very important; n = 15)



Source: Author's fieldwork data collected November 2008 – July 2009

The generic variable of environmental compliance is of moderate to minor importance to Chinese buyers. Contrastingly, environmental compliance is considered to be of critical importance to European buyers with respects to logs (and of importance regarding wood products). Similarly, the quality level of logs and wood products, as well as price is critically important to EU buyers. Volume

requirements are only moderately important to EU buyers relative to both other EU buyers' performance criteria and compared to Chinese buyers.

Clear differences exist between the European and the Chinese market based on the Likert scale results measuring the importance of firm performance criteria. Still, an interpretation of some variables cannot be made without further specifications. For instance one performance criteria set by firms is 'variety of tree species', which could mean that each delivery needs to be comprised of a specific mix of tree species, or that the dominant species per delivery either varies frequently or seldom. Hence, using qualitative data extracted from interviews with companies in Gabon, each standard is discussed in more detail below. Note that the discussion starts with a buyer requirement that was not captured by the formal quantitative analysis of standards, namely the degree of processing. However, respondents in Gabon considered it to be the most essential of all differences between the two markets. Indeed, the discussion below shows that this preference of foreign buyers related to the structure and capabilities of buyers' domestic processing industries.

#### **DIFFERENCES IN MARKETS: STAGE OF PROCESSING**

There is a uniform agreement among interviewees in Gabon that Chinese buyers strongly prefer unprocessed logs to processed wood products. This preference for logs applies irrespective of the different types of primary processed wood products such as sawnwood, veneer, and plywood<sup>75</sup>. One interviewee summarised Chinese buyer demands as follows: "Chinese customers have a clear preference for logs over processed wood". In more general terms, many respondents simply stated that "Chinese traders mostly buy logs", that "China wants logs, and this much stronger than our processed wood products", or that "Chinese buyers demand wood in log form".

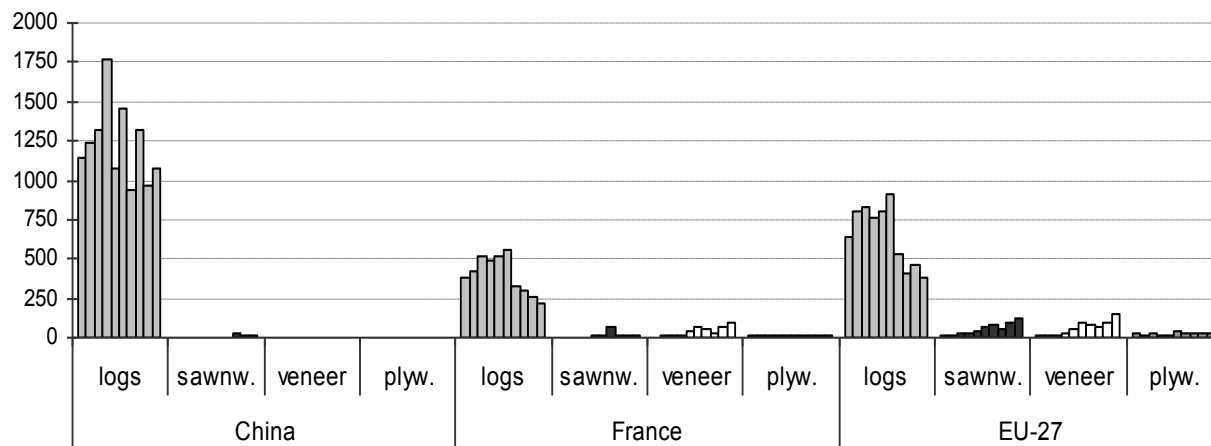
These statements are backed up by quantitative data obtained during interviews regarding companies' export destinations and product types. In general, China is the top log export destination as 85% of all interviewed companies export logs primarily to China. Only 15% of companies export their largest shares of logs to the European market. Contrastingly, for 67% of all interviewed processors the principal export location of primary processed wood products (sawnwood and veneer) is Europe, and for 25% the dominant importing country is South Africa. Plywood is most commonly exported to Europe

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<sup>75</sup> To our knowledge, none of the interviewed companies, or any other company in Gabon produces secondary processed wood products. These and minor volumes of primary processed products, such as poles, will thus be excluded from the discussion in this chapter.

(for 67% of all interviewed processors) or the United States of America (33%). Plywood is not exported to China and only an insignificant volume of veneers. China is a secondary or tertiary export destination for sawnwood. In short, companies' top buyers of processed wood are located in the EU, the USA, and South Africa, whereas the dominant share of logs are exported to China.

**Figure 6-2** Gabon's log and wood product export distribution to China, France and the EU-27 (1997-2006, CUM thousand)



*Source:* Data extracted from Forestry Trade Flows by the Food and Agricultural Organization of the United Nations (<http://faostat.fao.org>) accessed November 2009

When one recalls the structure of imports of China (Section 4.2), which showed a trend towards importing wood in its raw state to feed into local processing industries, both the quantitative data and the statements made by company representatives in Gabon fall into place. To further illustrate the differences between the Chinese and European markets, Figure 6-2 shows at glance the distribution of Gabon's exports of logs and wood products between 1997 and 2006. There is a strong concentration of logs being exported to China in contrast to increasing levels of processed wood products destined for the EU in general, and France in particular. To conclude, European buyers, though still buying significant volumes of logs, seem to request an increasing quantity of processed wood products. By contrast, Chinese buyers signal a very strong preference for logs, which feed into the expanding domestic processing industries.

#### **FIRM-SPECIFIC PERFORMANCE INDICATOR: SALES VOLUME**

Sales volume is the second most important performance criteria that should be met for access into the Chinese market, ranking a 3.9 on a five-point scale for logs and a 3.7 for processed wood (Figure 6-1). During interviews, company representatives expressed their opinions on sales volume in the following

words: “The Chinese buy such large quantities of wood that we now treat them as a new and separate market”. An explanation for Chinese large volume requirements was also provided: “I mostly sell to processing plants in China where the processing capacity is much larger than in the EU... the Chinese prefer much larger volumes of logs”. A Chinese trader further commented that his purchase volumes are never below 100 cubic metres and may reach up to 300 cubic metres per single transaction.

For buyers serving the European market, sales volume is the least important qualifying criteria. Sales volume scores a 2.9 for logs and 3.2 for wood products on a five-point Likert scale (Figure 6-1). The actual volume per transaction to Europe was described as small, meaning that orders (usually placed for a 20 or 40 foot freight container) from individual processors may amount to around 14 or 28 cubic metres respectively. Comparing European and Chinese buyers, interviewees said that “Chinese industries demand quantity not quality as the EU”, or expressed differently, “EU buyers want the highest quality and buy smaller volumes than Chinese buyers”. Due to the low demand for processed wood products from China sales volumes to the Chinese markets were not commented on as a point of major market differences.

It is important to point out that logging companies in Gabon in the majority of cases only extract trees from their concession areas when there is a confirmed buyer, at given local weather conditions and transportation capacities. This is because raw materials can achieve a higher price the ‘fresher’ they are, and because of high production and inventory costs associated with logging activities. Companies will thus not invest in the extraction of logs that will lose value over the time it takes to find a buyer on the (inter)national market. In short, extraction rates are almost solely determined by buyer demands due to the nature of the raw material and associate production costs.

#### **FIRM-SPECIFIC PERFORMANCE INDICATOR: WOOD QUALITY**

Wood quality is of moderate importance to Chinese buyers, ranking on average a 3.2 for logs and 3.4 for wood products on a five-point scale (Figure 6-1). Gabonese companies receive Chinese buyer requests predominantly for medium quality wood. Interviewees compared buyer preferences as follows: “Chinese buyers accept some faults [of logs], whereas EU buyers have stronger quality requirements”, or “The Chinese demand wood in log form of medium quality [but] European buyers require highest quality levels”. In terms of processed wood the following quotes provide good examples

of quality requirements: “We use our logs of inferior quality (and those rejected by buyers) to produce sawn woods [for China]”, and “Chinese have medium to good quality requirements, and we thus only process inferior quality logs [e.g. with splits] into sawnwood for them”.

In contrast, for EU markets quality is perceived to be the most critical performance criteria. On average, the importance of quality received a 4.7 and 4.9 for wood products respectively on a five-point Likert-scale (Figure 6-1). EU buyer demands are generally concentrated on high quality logs and wood products. Qualitative data expressed during interviews provide further evidence as “EU buyers are very quality conscious for high-end products”, and they “detect all quality inferiorities, and thus we have to carefully check our logs before exports. They [EU buyers] often check the quality of logs before exports, whereas most Chinese buyers let us check our logs for quality before exports”. European buyers are equally demanding regarding wood products where only minor or no faults are accepted.

For most logging/processing companies in Gabon, these differences exist due to variations in local industry structures and quality of final products. For example, one respondent said that “In China the processing costs are much lower and they have very efficient mills, which allows them to accept inferior quality logs relative to EU buyers”. The same reasoning was provided from another company representative saying that “Chinese industries can accept lower qualities as labour costs are very low in China; they can effort to have more labour work on lower qualities in further processing; they also have very efficient sawmills and use every bit of the tree, thus also allowing them to accept lower qualities”. To put it differently, wood with defects can be manually sorted in China due to low labour costs. Moreover, a generally medium lower quality is accepted by the market, where discards can additionally be fed into other industries (e.g. wood pellets and particle boards).

In comparison, the focus on the production of high-quality products leads many European buyers to source their raw materials much more carefully. In other words, the initial quality of the raw material determines to a large extent the quality of the final wood product. Thus, for European buyers who want to ensure a high quality final product it is necessary to exert control over the quality of raw materials. The sorting of logs and primary processed wood products is neither desired from the point of view of the final product, but also due to the higher labour costs associated with the sorting of logs and primary processed wood products. The latter function has thus been allocated to producers in the South.

## **FIRM-SPECIFIC PERFORMANCE INDICATOR: SPECIES SELECTION**

Of all Gabonese tree species some have traditionally not been demanded at all or only in relatively small quantities by European buyers. Particular France, due to the persistence of ex-colonial ties, has traditionally focused its log (and increasing wood product) purchases on Okoumé and a relatively small selection of other hardwoods species. Yet, an increasing number of hardwoods are now commercially traded explicitly because of demand from Chinese buyers. For example, in one company brochure it says, "... species that have remained unknown by customers and other major timber companies for more than 20 years and are now requested by the emerging Chinese ... markets". One such species is Okan, which according to respondents, has only been introduced to the market recently: "We did not trade with Okan internationally [... but] Chinese markets started to purchase large volumes over the past three to four years".

While Okan is an example of a 'newly' utilised species, it should be highlighted that Chinese buyers accept a wider range of species (including Okoumé), and that they thus display less distinct preferences for certain wood characteristics. This is reflected in the Likert-scale result of 3.3, or a degree of moderate importance of tree species variety to Chinese buyers (Figure 6-1). Representatives of logging companies in Gabon described Chinese buyer preferences in general as absent, as "they purchase everything they can get their hands on", or as "(...) Chinese take logs of all species, also hardwoods not requested by EU markets in the past". Apart from these general comments, some interviewees said that "The Chinese take all species but there are some preference towards Azobé, Lofira, and Alata".

Tree species variety was rated as important to European buyers, i.e. it has a degree of four on a five-point scale. Next to Okoumé, the traditional species of choice, interviewees mentioned a limited number of other hardwood species requested by EU buyers, such as Sapelli or Iroko, based on preferences for specific wood characteristics. Whereas in most cases this difference was assigned to overseas processing industries' characteristics (where different types of wood products require certain wood characteristics, see Box 6-1), one interviewee explained difference in preferences also in terms of wood appearance as "My European customers prefer lighter colours, [... whereas] both the Chinese and Indians like dark brown and dark-reddish colours". Comments made earlier about buyer-driven extractive activities can now be further specified. Buyer demands, more specifically those from

European markets, not only determined the time of extraction but also which trees are felled with respect to species, tree quality and the total volume.

**Box 6-1** Tree Species and their application

Each individual tree species has its own wood characteristics, which determines what types of products can be produced and with which methods. For example, Gabon's dominant tree species Okoumé has wood characteristics that allow both the peeling and slicing of logs into veneer. These sheets can then be applied with glue and when stacked crosswise, compressed to form plywood. Ozigo has similar characteristics though it can only be peeled, not sliced into veneer. Contrastingly, Okan, which has only recently been introduced to the global market due to Chinese wood preferences, is used to produce sawnwood. It is not possible to process Okan into veneer and thus plywood. Okan sawnwood is consumed by the construction industry, as well as the furniture and flooring processing sectors. Additionally, Okan and Azobé poles are sought-after wood products for the construction of ports as they have a very hard core and resist salt water well. Due to its natural stability and resistance, Azobé is also used to produce train sleepers. While Azobé cannot be used to produce veneer sheets, other species such as Iroko, Padouk, Sapelli (also called Sapele) and Kevazingo can all be sliced. Yet, their colour schemes differ from Okoumé and Ozigo: the latter are pinkish whereas the former trees have red-brownish core wood colours. Due to its appearance in colour and durability Sapelli, for example, is used to produce flooring but also musical instruments. In all cases, the combination of a tree's natural characteristic and buyers' preferred application will thus determine which species are exploited and partly how they are processed into the desired wood product.

*Source:* Author's data collected November 2008 – Feb. 2009; SNBG (n.d.-b); La Banque Mondiale des Essences de Bois (global database for tree species) by l'Agence Nationale pour l'Innovation (ANVAR, National Agency for Innovation), [www.le-bois.com](http://www.le-bois.com), accessed August 2009

**FIRM-SPECIFIC PERFORMANCE INDICATOR: PRICE**

The price of both logs and wood products is of similar critical importance to all groups of buyers. With reference to the above Figure 6-1, price is the most decisive performance criteria for Chinese buyers scoring a degree of 4.9 for logs and wood products. The same holds for European buyers where price is of similar critical importance than quality scoring a 4.6 on a five-point scale for both logs and wood products. However, while price seems to be of the same significance to Chinese and European buyers alike it is not determined by these buyers. In contrast, it is generally determined by the international market, i.e. interviewees explained that global prices are used as a benchmark for final price negotiations. Yet, there are two distinctions between Chinese and European buyers worth mentioning.

First, a couple of respondents stressed the fact that European buyers usually accept the current

market rate, whereas some Chinese buyers try to bargain over prices. To use an interviewees' words, Chinese buyers "try to push down the price by claiming log quality defects upon arrival in China", which forces him to "find another buyer for these rejected logs, instead of trying to find an agreement with the initial Chinese buyers as such difficulties are hard to solve without a representative in China, where the legal regulations are not clear". Other interviewees who reported the same situation further mentioned that they regard this behaviour as against the industry code of conduct. Secondly, prices for logs and wood products are of decisive importance to both groups of buyers. Yet, this does not necessarily translate into an equalisation of real sales prices paid to producers. Prices will only be the same, if all price determinants are equal at the time of purchase. The price level is determined by a number of variables, most fundamentally of all global demand and (inter)national supplies, next to quality, species, girth or wood product specifications, total sales volume, as well as the price of oil and freight costs.

Leaving aside transportation costs, larger purchase volumes can have the effect of lowering the per cubic metre price of logs where this effect has only been reported for transactions with Chinese buyers. One respondent summarised the effect as follows: "Chinese buyers usually order large volumes, and therefore prices are relatively low compared to those from buyers from other geographical areas". Moreover, prices for various species might differ markedly, and in turn seem to be influenced by the species' natural occurrences in Gabon and current international demand and supplies of the species closest substitute. To give an example, log prices (per cubic metre) recorded in Gabon range between €78 for Azobé and up to €350 for Moabi (in 2007). Still, for all species high quality logs are likely to achieve higher prices. According to data from the Société Nationale des Bois du Gabon for 2006, Okoumé of highest quality was priced at roughly €170 per cubic metre compared to €57 for logs of lowest quality (SNBG, 2006).

Buyer's desired wood product specifications have an influence on the method of processing. In other words, as logs are processed less of the actual wood mass can be preserved when logs are processed into primary processed wood products. In general, wood utilisation rates decrease with increasing quality requirements and intricacy. At the same time, more labour-hours are necessary to produce a higher quality and/or more intricate wood product. These two factors jointly increase the final sales price for these products. As a rule of thumb, processed wood products made for the EU market are



thus sold at a higher price than those for the Chinese market. The impact of sales volume on the price of processed wood is less clear. Yet, overall volumes going to China are relatively small and thus are unlikely to have a significant influence on prices (where the opposite was true in the case of logs). With respect to European buyers, other variables' influences on price, such as quality and product specifications seem to be far greater than quantity.

Furthermore, it has to be remembered that international demand as one of the fundamental determinants of international market price is in fact influenced by China's major impact on global timber prices. This can best be illustrated with two examples extracted from interviews. Demand for Eyong has been traditionally limited to Turkey with a price of around €175 per cubic metre until sudden and significant purchases from China increased the cubic metre price to €260 within three months (in 2007/08). Similarly, the sales price of Okan reportedly fluctuates in line with Chinese demands, given that China is the strongest consumer of large volumes of this particular species. In an earlier chapter (Section 4.1) another example was provided for a case where the seizure of a significantly large volume of illegal Merbau logs destined for China resulted in an increase in price of the respective species.

#### **FIRM-SPECIFIC PERFORMANCE INDICATOR: PRODUCT SPECIFICATIONS**

There is a uniform agreement that wood product specifications are set by all groups of buyers, and that hence although there are common dimensions for many primary processed wood products, these are thus not produced in anticipation of market demands<sup>76</sup>. Yet, Chinese buyers seem to be more lax in their expectations of producers' skills to meet their product specifications. In the comparative scale result, it was considered to be only of moderate importance to Chinese buyers receiving a 3.4 on a five-point scale (Figure 6-1). Interviewees further elaborated that the majority of processed wood products produced for Chinese buyers are less intricate than products going to the European market. Figuratively speaking sawnwood might be more 'bulky' approaching the dimensions of train sleepers rather than wooden slats.

The design of wood products, or being able to meet specified product specifications, is another critical skill desired by European buyers. Put differently, design was given a 4.7 on a five-point scale and was

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<sup>76</sup> One exception to this rule is the production of train sleepers, where a very small volume is fabricated without an explicit contractual order according to international standards and dimensions.

thus judged to be of critical importance to EU buyers. Product specifications usually include variables with reference to product dimensions, such as the length and width of a product, or layers of veneer sheets for plywood, but may also include fibre characteristics as expressed through species preferences. Additional requirements may include wood's moisture content, which determines whether wood products are dried before being exported. As mentioned above, the higher intricacy and quality of EU products vis-à-vis those produced for the Chinese markets increase the relative price.

Whereas production specifications are determined by foreign buyers the production process is at the discretion of the processor in Gabon. However, there is only a limited range of processing methods, with processing companies in Gabon following normal industry practices (PAPFFG, pers. comm., November 2008). For example, veneer sheets are usually produced by slicing or peeling logs with the latter being the dominant method in Gabon (due to the dominance of Okoumé and Ozigo; see Box 6-1). In GVC terms there is thus a low degree of governance for the simple reason that primary stages of processed wood products productions follow widely known industry norms that make standard specifications by individual firms redundant. Yet, the quality of the wood product is largely determined by the quality of the logs (and thus tree), which in turn is controlled by the buyer.

#### **FIRM-SPECIFIC PERFORMANCE INDICATOR: ENVIRONMENTAL COMPLIANCE**

Both quantitative and qualitative data show a great discrepancy in the importance of environmental compliance of producers across buyers. For European buyers, it is of high importance that producers apply environmental standards both throughout the production of logs (4.5) and wood products (4.4) (Figure 6-1). Contrastingly, it is the least important performance indicator for Chinese buyers with a degree of moderate importance, or 2.7 on a five-point scale (both for logs and processed wood products). During interviews, it quickly became apparent that most interviewees tended to predominantly associate legality and sustainability certification with the term environmental compliance<sup>77</sup>. Still, these are civil society standards determined external to the chain. In other words, certification schemes are mostly introduced by parties like environmental NGOs and are monitored by third-parties. While producers have the option of obtaining certification, individual producers do not exclusively determine the standard specifications. A more detailed discussion around legality and sustainability requirements is presented in the following sub-section.

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<sup>77</sup> It may also include the respect for the forests' biodiversity, for example through the protection of endangered species, or the prevention of bush meat hunting in the concession areas of companies.

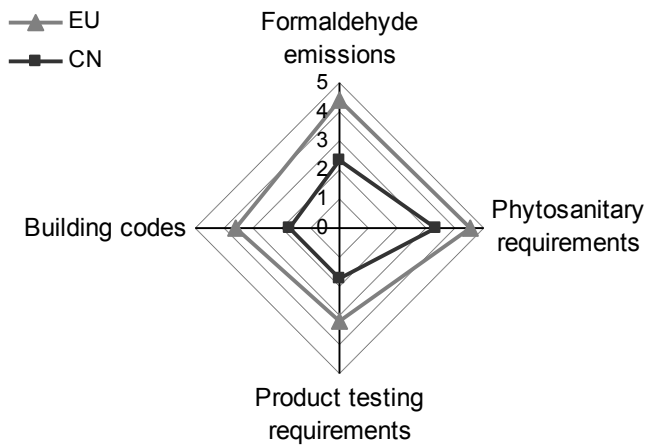
## 6.2.2 PUBLIC REGULATIONS

In addition to product and process requirements set and defined by buyers to producers in Gabon, there are a number of international technical regulations that are outside of buyers' decision-making realm, i.e. which are defined in part or whole by public actors on a national and regional level. Variables discussed in this section have already previously been identified as possible non-tariff barriers to trade (see also Section 4.4). For instance, UNCTAD and the ITTO (n.d; Taylor et al., 2005b, p.18) write that "Some tropical producer countries have expressed concerns that evolving product standards and technical regulations in consumer markets are restricting the expansion and diversification of the international tropical timber trade". With the globalisation of trade, government concerns for consumer health and safety spurred the introduction of phytosanitary measures that demand producers to "render the offered commodity free from unwanted dirt, seeds, pests or germs" (FAO, 2004, p. 92) and "to protect human life from plant- or animal-carried diseases; to protect animal or plant life from pests, diseases, or disease-causing organisms; to prevent or limit other damage to a country from the entry, establishment or spread of pests" (UNCTAD, n.d).

In comparison, European buyer requirements are more stringent than those of Chinese buyers regarding technical regulations considered in aggregate for logs and wood products (Figure 6-3). In fact, with the exception of phytosanitary requirements all other standards are considered to be of no or minor importance to Chinese buyers. Contrastingly, these standards are on average important for EU buyers, and thus access to EU markets. Our results thus confirm earlier findings regarding non-tariff barriers to trade, as especially phytosanitary requirements (applying to both logs and wood products) were rated as critically important (4.5) by EU buyers and as moderately important by Chinese buyers (3.3).

The relatively high weight of phytosanitary standards was confirmed during interviews. For example, one interviewee reported that "The phytosanitary requirements are the most important international regulation [for access to China]". A Chinese company in Gabon provided a similar statement regarding their buyers, where "Our middlemen don't ask for certification other than the phytosanitary papers". A Chinese trader identified the phytosanitary certificate as part of the standard paper work, i.e. "I buy logs from everyone as long as the necessary documents, such as confirmation of payment of taxes and the phytosanitary certificate, is available".

**Figure 6-3** Public technical regulations (1 = not important, 5 = very important; n = 15)



Source: Author's fieldwork data collected November 2008 – July 2009

Adherence to maximum levels of formaldehyde emissions were rated as important (4.4) for EU buyers (Figure 6-3). The latter refers to emissions released by certain adhesives used to produce plywood and pollution from paint, thus only applying to processed wood products. Contrastingly, emissions of formaldehyde were considered to be of minor importance (2.3) to Chinese buyers. Both the observation of building codes (3.6) and product testing requirements (3.2) were thought to be of moderate importance to buyers procuring for EU markets. To give an example, one processor of train sleepers explained that “For our products the most important building code is the UIC 863<sup>78</sup> for access into the EU markets”. In contrast, the building codes and product testing requirements, each with a value of 1.7 on a five-point scale, are of minor importance for Chinese buyers. Overall, this outcome should not come as a surprise as most of Gabon's exports are in raw materials with little or no need to apply technical requirements usually associated with primary and especially secondary wood products.

### 6.2.3 PRIVATE (GLOBAL) STANDARDS

In this section differences are discussed between the European and Chinese markets with respect to standards set by civil society like international non-governmental organisations, or international bodies like the International Organisation for Standardisation (ISO). Similar to technical regulations discussed above, the global standards selected for our analysis, are generally defined by actors external to the value chain, in particular in light of sustainable resource usage and/or the origin of logs and wood products. For example, the ISO 14000 environmental standard certifies a company's commitment to compliance with national legislation and regulations, as laid out in environmental policy, plans and

<sup>78</sup> UIC 863-0: Technical specification for the supply of non-treated track support (January 1981); UIC 863-1: Use of non-EU timbers for the manufacture of sleepers (January 1986) (UIC, 2008)

actions specific to each firm ([www.iso.org](http://www.iso.org)). The introduction of a third-party certificate about the production method of tropical timber was introduced because “Much of the world’s remaining natural forests still suffer from illegal exploitation, poor management and conversion to other land uses, commonly resulting in severe degradation or complete destruction. It was these very concerns that led to the establishment of FSC [Forest Stewardship Council] in 1993” (FSC, n.d.-a).

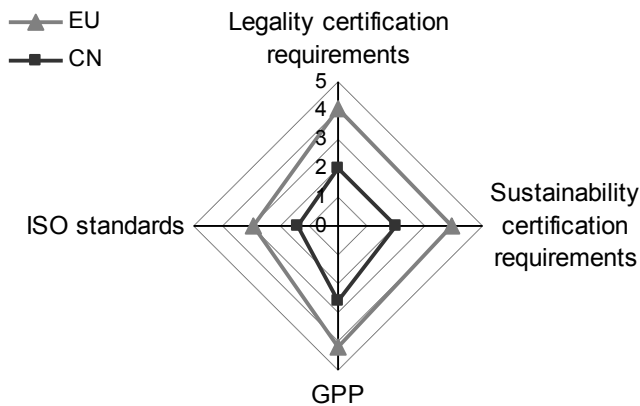
Yet, it has to be pointed out that with regards to environmental certification and labelling schemes, i.e. sustainable resource usage (represented through the Forest Stewardship Council certificate) and the legality of raw materials (represented by the Origine et Légalité des Bois (OLB) certificate first introduced by Bureau Veritas), private firms and external governance agencies may co-operate in networks in defining standards (Iizuka et al., 2009; Nadvi & Wältring, 2002, 2004). As was argued earlier (Section 2.2), firms may choose to participate in standard-setting networks to reduce transactions costs and to achieve a global acceptance of their activities, which are increasingly being monitored and criticised by civil society. To give an example, Bureau Veritas ([www.bureauveritas.com](http://www.bureauveritas.com)) writes, “The OLB system was developed in 2004 ... to meet our clients demand for an official third party certificate regarding their wood products legality”.

It should further be noted that third-party certificates are further discussed in this sub-section under the heading of green public purchasing (GPP) requirements. This is because such civil society standards might be accepted by national governments as proof of meeting governments’ procurement criteria (Simula, 2006; Jackson, 2009). To give an example, “[UK] Central government departments, their executive agencies and non-departmental public bodies are now required to procure timber and wood-derived products originating from either legal and sustainable or FLEGT-licensed or equivalent sources” (CPET, 2010, p. 10). Similarly, under German legislation “FSC and PEFC certificates are accepted as evidence of ‘legal and sustainable’” (Jackson, 2009, p. 23).

The empirical results, depicted graphically in Figure 6-4, confirm the discrepancies between European and Chinese buyers with respect to the general results of environmental compliance discussed earlier in this section. In other words, across all four global standards European buyers set stricter requirements to producers in Gabon than their Chinese counterparts do. Whereas legality and sustainability certificates, as well as conformity to importing countries green public purchasing (GPPs) regulations are considered to be important (4.0) for access to the EU market, these are of minor

importance to Chinese buyers (with an average Likert-scale value of 2.3). According to the numerical value of 1.3 on a five-point Likert scale the ISO 14001 environmental standards is of no importance to Chinese buyers, but perceived to be of moderate importance (3.0) to buyers in Europe. Each type of standard is discussed in more detail below.

**Figure 6-4** Civil society standards (1 = not important, 5 = very important; n = 15)



Source: Author's fieldwork data collected November 2008 – July 2009

#### **PRIVATE STANDARDS: LEGALITY AND SUSTAINABILITY CERTIFICATION**

For producers in Gabon, the ability to be awarded a certificate of legality and/or sustainability were rated as important by EU buyers (4.1 on a five-point Likert scale; Figure 6-4), as according to a representative of a logging company in Gabon “The EU market is the driving force for sustainable forest management systems, and legality and FSC certification”. Interviewees further said that “EU buyers demand FSC certification”, or that “it is increasingly important to have a FSC-CoC [Chain of Custody] certification along the vertically integrated line of production”. One interviewee further elaborated by saying “certification is very important as the forestry industry has a bad reputation due to environmental concerns and poaching of bush meat ... it is like a quality assurance to foreign buyers”. Yet, as highlighted by the following statement, certification is strictly restricted to the European market: “We plan to obtain an OLB [legality] certification for EU products only”.

With respect to the Chinese market both legality and sustainability certification requirements scored a 2.0 signalling only a minor importance, or insignificance for market access (Figure 6-4). These results suggest an even lesser importance than the more generic variable of environmental compliance of the previous section would have allowed, where the value of the latter variable was 2.7 for both wood and wood products. Yet, qualitative data extracted from interview notes depict a situation of indifference of

Chinese buyers towards certification as, “There are no requests for certified wood from Chinese customers”, or “The Chinese have no interest in certification and mainly concentrate on logs”, and “The Chinese market does not ask or care about certification”. One EU producer made an explicit link to legality ‘attitudes’ in China, where “The Chinese are known to import illegal timber and pay no price premium for certified wood [as a result certified wood is not sold to China]”.

Next to these differences between buyers from the European and Chinese markets, interviewees differentiated in our discussions more accurately between the two schemes (i.e. FSC sustainability certification and OLB legality certification), where legality requirements were perceived to be of higher importance than sustainability requirements to EU buyers<sup>79</sup>. For instance, one respondent commented, “My [EU] buyers ask more often for legality certification but not FSC”. Thirdly, certification in general was also thought to avoid NGO scrutiny and thus to counteract the industry’s negative public reputation in the North. This can be illustrated with a quote by a company representative saying that “... it would be good to have either an OLB or FSC certification to support the trust placed on our company”. Next, for some companies being FSC certified also translates as an additional standard that signals quality (of both logs and wood products) to potential buyers.

Lastly, the FSC certification scheme was often regarded with more ambiguity as it was not clear whether EU buyers will assign a price premium to FSC certified wood. This holds particularly true in relation to the relatively higher certification costs associated with FSC than with OLB. Interviewees expressed these concerns as: “We are not certain whether there is a price premium on FSC-certified wood and we are uncertain whether the costly FSC investments are the right step to take”, or “We are currently not considering FSC certification as there is no price premium in Europe; the price would need to increase to cover for the extra ecological costs”. These uncertainties prevailed among companies which have not yet embarked on the process of certification. During an interview with a representative of an FSC certified company indications were given that a price premium does exist in the EU market. At the same time, the respondent confirmed the relatively high costs associated with FSC certification.

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<sup>79</sup> In individual cases Microbois might be used, which is an electronic system in support of forest inventories and wood traceability; this method is accepted by major certifying agencies as a device to trace individual logs along the supply chain.

Note that whilst an increasing number of EU buyers inquire about producers' production methods reflected through certification, it is not mandatory to be certified to access the EU. In other words, none of the interview partners said that they were excluded from the EU market because they are not certified. Instead, certification was considered a marketing tool (as described above). Furthermore, even of those companies that are certified it does not necessarily cover the entire concession area and/or all processing units. In fact, as mentioned above, companies were perceived to only pursue a certification of an area size to satisfy EU buyer demands qua volume. This also suggests that one EU buyer demands for certified wood and wood products are satisfied (and where a price premium covers the high investment costs), additional markets like China are served from non-certified concession areas. This separation is possible as for example the FSC certificate is assigned to a forest area and/or individual processing mill but not a company per se.

#### **PRIVATE STANDARDS: FLEGT AND GREEN PUBLIC PROCUREMENT**

Only two interviewees brought forward the connection between legality certification requirements and both the FLEGT Action Plan as well as green public procurement (GPP) policies of some EU countries: "The OLB [legality] certificate is important to enter the EU market; the FSC is important, too, but to us the legality verification is currently more important as this is what is required by FLEGT and government policies". Nevertheless, as one industry expert from the French Embassy told the author, Gabon has so far not signed a Voluntary Partnership Agreement (VPA) with the European Commission. Thus, unless a government agency is the direct procurer of wood or wood products, it is likely that other buyers do not refer to these policies as mandatory in negotiations with producers. Interestingly, although GPPs were ranked as important to EU buyers in the formal analysis the differences between the qualitative data and statements made during interviews cannot be explained.

China is considered critical to the success of the FLEGT programme as tropical timber enters the EU via China, where logs are processed into wood products (C. Besacier, pers. comm., December 2008). The Chinese government has not signed a VPA with the European Commission, either, thus leaving the possibility that whilst an agreement may be found between the European Commission and Gabon, non-certified wood can easily be re-directed towards China, either for domestic consumption or to be processed for the EU markets. On the contrary, should China sign a VPA and legality requirements are enforced in China these would consequently reflect on the procurement of raw materials from Gabon,



which then need to be certified with respect to legality. Currently, however, non-certified wood makes up the bulk of total trade volumes between all countries (Gabon, Europe and China).

#### **PRIVATE STANDARDS: ISO MANAGEMENT STANDARD**

The ISO 14001 environmental management standard is of equally minor importance to Chinese buyers. This standard certifies a company's commitment to compliance with national legislation and regulations as laid out in environmental policy, plans and actions specific to each firm. The existence of the ISO 14001 standard is of moderate importance to EU buyers with a rating of 2.9 (Figure 6-4). During interviews the ISO environmental management standard was not identified as either being critically important or to be a factor signalling particularly large differences between EU and Chinese buyers. Indeed, only two companies pointed out to the interviewer that they are ISO 14001 certified.

#### **PRIVATE STANDARDS: LABOUR REGULATIONS**

Labour standards were identified as a variable where European buyers differ from Chinese buyers. Labour standards in the producer country were not captured by the questionnaire, but have been reported by a few companies as being of moderate importance to only EU buyers. At the same time though, firm-specific performance criteria do not apply, nor do firms refer to global standards covering labour rights. Indeed, only one respondent said that they orientate their human resource standards to those set by the ILO (International Labour Organization) and this despite the fact these are not explicitly demanded from their buyers. An example of labour standards given by the company representative is the provision of protective clothing to their workers. According to the same interviewee there are only two companies in Gabon working at such high standards. In general, it seems that it is at the discretion of each individual company in how far international labour standards with respect to safety and health are being met.

In our opinion, the discussions about environmental topics such as sustainability and legality by far outweigh current 'international' concerns about working conditions. In fact this bias is reflected and informed by the choice of civil society standards that were formally tested (i.e. included in the Likert-scale questionnaire, see Chapter 3). Given the focus of this thesis the existence, implementation and enforcement of national regulations regarding labour standards was not included in the discussions with logging/processing companies in Gabon.

### **6.3 PRODUCER SELF-ASSESSMENT**

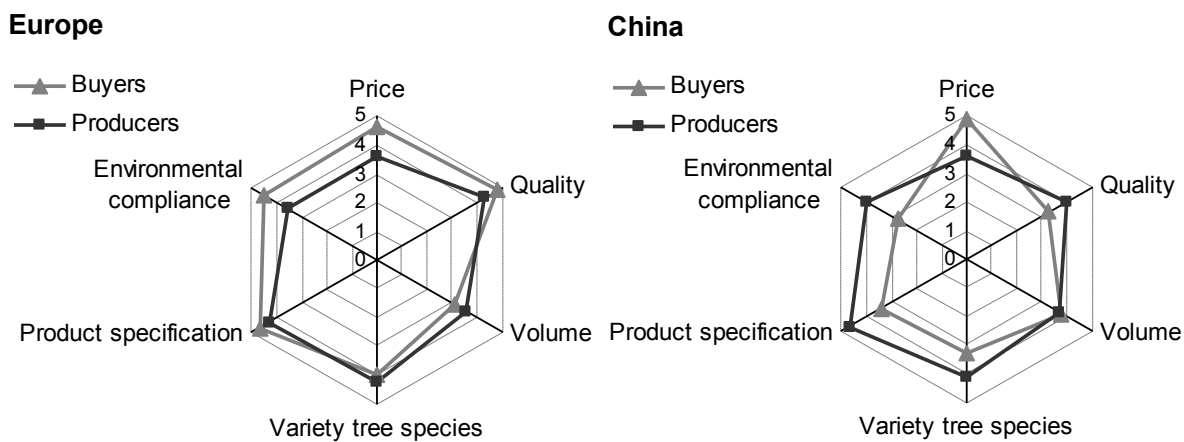
The previous section demonstrated that the Chinese and European markets are characterised by differing performance indicators, public regulations and civil society standards. The generally lower importance assigned to standards by Chinese buyers should translate into a faster integration into global value chains and into an easier access to the Chinese market as requirements are supposedly easier to comply with from a producer's perspective. For example, instead of focusing on achieving and/or improving the quality of logs and wood products to be considered a supplier for EU buyers, their Chinese counterparts place a strong emphasis on quantity (of medium-quality logs and wood products).

The documented demand for processed wood products from European buyers could provide an opportunity for producers to enter into these respective downstream processing activities, which are assumed to result in higher producer surpluses. In contrast, Gabon has been presented as a large exporter of tropical logs but not as a major producer of primary processed wood products. It does not participate in the production of secondary processed wood products for the international market. Earlier chapters (Chapter 4 and 5) clearly highlighted several domestic variables that retard the move by producers into higher value-adding activities in general, such as a lack of skilled workers, processing inefficiencies and the political economy. In the particular case of Gabon Dutch Disease effects, political economy and the failure of the state to adequately regulate and support the forestry industry have hindered its industrialisation.

In order to be able to interpret the research findings qua market differences in standards it is thus essential to have a complementing analysis of producers' abilities in Gabon to meet either or both Chinese and European market entrance requirements, here symbolised through buyer standards. The capability (and/or capacity) to meet foreign buyer demands is represented in quantitative terms in Figure 6-5, which shows the degree of conformity by producers in Gabon with European and Chinese buyer standards for firm-specific performance criteria. Producers in Gabon judge their performance on average to somewhat fall short of European buyer expectations but to often excel those of Chinese buyers.

Although producers had the option of judging their performance separately for each Europe and Chinese buyers' requirements, the answers are more or less similar<sup>80</sup>. In other words, producers' perceptions of their own abilities appear to be the same in the two radar charts in Figure 6-5. In fact, producers gave testimony of their abilities in general and thus irrespective of the definition of buyers, so that differences relative to respective buyers' expectations are hence a result of variations in the latter. Given that European countries are the 'traditional' export markets for most tropical timber producers, it can be reasoned that producer activities have largely been determined by EU buyers. Yet, the resultant level of 'sophistication' of producers in Gabon still somewhat falls short of EU buyers requirements, although exceeding Chinese buyer requirements.

**Figure 6-5** Producer ability to conform to buyer standards (1 = extremely poor, 5 = very good; n = 15)



Source: Author's fieldwork data collected November 2008 – July 2009

Note: Buyers = perception of buyer requirements by producers in Gabon, Producers = producers' perception of their performance

More specifically, producers in Gabon specified that their performance in light of European buyers' quality specifications (4.4, 4.7), price perception (3.7, 4.6) and environmental compliance standards (3.7, 4.4) are good, but compared to overall demands are not quite good enough to achieve a full match (Likert-scale values stated in brackets for producers and buyers respectively). Yet, the two variables that are relatively less important to EU buyers, variety of tree species or the ability to supply specific tree species (4.1, 4.0) and volume (3.6, 2.9), can be complied with beyond the buyers' expectations. In contrast, existing production capacities could be further improved given both the physical volume requirements from the Chinese markets and the importance of this performance indicator to Chinese buyers (3.7, 4.0). Producers' capacities/capabilities with respect to quality (4.0,

<sup>80</sup> The numerical values of producers' performances compared to their perception of foreign buyer requirements differ by a maximum of 0.4 points. The averages of the two Likert-scale results of producers' performance compared to EU and Chinese buyer requirements each in aggregate do not differ.

3.3), the range of tree species (4.0, 3.4) and environmental compliance (4.0, 2.7) surpass those of Chinese buyers. Yet, price conceptions differ strongly (3.7, 4.9).

The results can be further specified with qualitative data extracted from interviews with respect to firm-specific performance criteria, where the discussions with producers in Gabon largely focused on quality requirements of European buyers. Given the small volume of exports of processed wood of medium quality and medium quality log demands, being able to meet Chinese quality requirements was not an issue of concern for producers in Gabon. Producers also stated that the ability to meet European buyer requests for high(er) quality logs and wood products is not only essential to be considered a supplier, but also that it is the one factor that differentiates Gabonese forest products from those of Chinese imports to the EU (i.e. third-market competition). One respondent in Gabon said “in Europe we can only compete on quality because Chinese products are so low priced”. Others further explained, “Chinese products are inferior to our products”, and that “Chinese products are too cheap, their wages are so low, they work harder, and they do not have to pay for environmental costs”.

In this sub-section, Figure 6-3 is not reproduced and matched with producers' perceptions of their performance. The reason for this is that technical issues do not apply (specifically for logs) and that during interviews technical standards were never singled out as a significant problem<sup>81</sup>. For instance, producers in Gabon specified that meeting the request for phytosanitary certificates is relatively easy. In fact, as representatives of a logging companies and traders explained, the phytosanitary certificate is part of the standard paper work and “there is no problem executing these [phytosanitary regulations] on the ground”. The other technical standards, such as formaldehyde emissions, were often not mentioned during interviews or were only briefly commented upon after the request of the author.

However, many producers appear to struggle in light of environmental standards, in particular certification requirements as it is difficult to accumulate the necessary investments required for both legality and sustainability certification processes. For instance, one interviewee said that “we are not

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<sup>81</sup> The relatively low degree of concern amongst producers regarding their ability to comply with technical standards led to the exclusion of these Likert-scale questions from the questionnaire distributed to producers and processors in Gabon in favour of other topics. The same reasoning holds for the absence of a reproduction of Figure 6-4 matched with producers' perceptions of their performance, i.e. both the ISO environmental management standard and green public purchasing policies in importing countries were rarely mentioned by interviewees as issues of major discrepancies in their actual performance versus that demanded by foreign buyers, specifically European buyers (see also Section 6.2.3). Given time limitations during interviews and concerns about the length of the questionnaire the author thus decided to allocate more time during interviews to the discussion of third-party certificates resulting in qualitative data stated above and presented in the subsequent chapters (Chapter 7).

certain whether there is a price premium on FSC wood and we are not sure if the costly FSC investments are the right step to take". Similarly, a representative of another logging company stated, "We are currently not considering FSC certification as there is no price premium in Europe". Overall, the need for certification for access to the European market (not the Chinese as discussed earlier) was not questioned but the ability to finance such a certification process and the yearly costs to maintain the required standards were judged to be a considerable problem.

The above statement already allow one to deduce that domestic production costs are of considerable concern, i.e. more generally speaking, domestic factors of production featured much more prominently in discussions than problems relating to firm-specific standards (where 'underperformance' here is often a result of the former), technical issues, and to some degree environmental standards. Domestic factors of production that limit producers ability to perform fall into four categories namely infrastructure (especially physical infrastructure limiting transportation possibilities), production costs (both environmental compliance costs as well as those relating to capital expenses and wage costs), industry barriers to entry (e.g. access to the forest stock) and recent changes to the legislative, domestic framework (e.g. limiting the capacity of production). In addition, the reported low 'price' performance in comparison to both EU and Chinese buyers demands have to be related to production costs, too, as the price is defined by the international market. These topics are addressed in more detail in the following chapter (Chapter 7).

#### **6.4 CHAPTER SUMMARY**

The first research outcome of the comparative exercise is the observation of a relegation of traditional EU-buyer defined product and processing standards through the entrance of China as the new dominant buyer. This holds in particular for the degree of processing before export, where Chinese buyers clearly prefer raw materials to processed wood products. The outcome was directly linked to secondary data presented earlier (Chapter 4), where Chinese raw material requirements stem from a need of domestic industries for input materials. Hence, producers are confronted with requests for logs from Chinese buyers, but for logs and all three types of wood products from European buyers. Differences between markets persist for firm-specific performance criteria both with respect to the degree of importance of each standard to groups of buyers, and regarding the definition of each standard. Our research has further demonstrated that Chinese buyers apply fewer international

regulations, and these to a lower degree than is currently practiced by European producers.

Standards concerning production methods, ownership and compliance with national regulations showed large differences between buyers. Put differently, Chinese buyers usually do not require any certification of sustainable production methods or legality, nor regarding compliance with national legislation, all which are gaining importance for access to EU markets though with somewhat more emphasis on legality certification. It should be highlighted that a possible depletion of resources in the absence of sustainable production methods (both due to an increase in volume and the range of species demanded by Chinese buyers), may in fact impact on future resource supplies of raw materials, as well as on public goods such as fresh air and carbon sinks. It was already shown that the intensive margin of production in Gabon has recently increased (Chapter 5).

Not all types of standards which are seen as critical are actually controlled by buyers. Put differently, while price (of logs and wood products) was rated as critically important for Chinese and European buyers, producers do not adjust productions to conform to a price determined by the buyer. Instead negotiations are based on international market rates (for different types of species and quality categories). In other instances, a high degree of control by the buyers is not necessary as industry specific standards exist. For instance, whilst conformity to phytosanitary measures is an important criterion for access to China and Europe there exists an international documentation system, where documents are issued to the producers who have met the standard and these documents are routinely send to the buyer. Similarly, European buyers (and in fact governments) accept third-party certifications such as FSC as proof that producers apply sustainable production methods.

Governance hence applies in areas that are important to the firm and in those cases where a widely accepted global standard (both public and civil society defined) does not exist. To give an example, wood products that do not meet the specifications and/or degree of quality set by buyers will be rejected (especially by European buyers) or may result in a reduction of the sales price (mostly applying in the case of China). Furthermore, as quality levels are critical to European buyers these reportedly visit the production site more often than their Chinese counterparts do, who rely on producers in Gabon to sort and control logs and wood products for quality defects before exports. Such differences are also a result of the existing ability of producers to meet almost all Chinese buyer

requirements, as these were initially acquired to gain access to the EU market.

Producers in Gabon assessed their abilities to sufficiently meet Chinese market demands but at times fail to comply with those set by European markets. This holds in particular for quality levels of both logs and wood products, which were shown to be equally a result of producers' product differentiation strategy vis-à-vis tropical wood products imported to the EU from China (where the competitive factors are price and volume). Given the concentration of the forestry industry in Gabon on the exportation of logs, compliance with technical requirements was not a topic of concern. To the contrary, producers identified domestic issues such as the national legislative framework next to production methods (certification) to be areas where their current performance falls short of EU buyer expectations. The following chapter (Chapter 7) provides further information on prevailing industry entry barriers and the current uptake of certification in Gabon.

## CHAPTER 7 GABON'S TROPICAL TIMBER VALUE CHAIN AND CHINESE PRODUCERS' INTEGRATION

In the previous chapter (Chapter 6), it was evidenced that buyers in China differ strongly from their European counterparts in their requirements concerning process and product standards. While Chinese buyers' preferences seem to reinforce the exportation of logs, European buyers increasingly demand processed wood products. EU buyers' performance criteria were identified as price, quality, and species. Moreover, there is a more stringent application of international regulations and environmental standards, in particular legality certification, among EU buyers than Chinese ones. The insignificance of 'environmental' civil society standards and other international regulations to Chinese buyers suggest that market access to China is more facile, or actually defined over a different set of variables namely price and quantity.

Buyer-determined industry governance prevails for those standards that are critical to the buyers, where a global standard does not exist and/or where producers' performances need to be monitored. Production and processing activities in Gabon are also subject to national governance (Chapter 5). Because of the absence of legislation in the early period of the industry's development, French market demands clearly shaped the activities of Gabon's forestry industry during that time. Contrastingly, the dominance of the Chinese market crystallised more or less at the same time as state regulations were imposed. Chinese buyer standards conflict with the reform's main goals of higher rates of domestic processing, and thus domestic value plus employment creation.

In recent years, Gabon's production focuses on logs for exportation to the Chinese market, as well as to a smaller degree on sawnwood for the European, South African and recently also Chinese market. Yet, log and sawnwood productions are low value-adding activities with high levels of global competition. These activities should hence be relatively unprofitable due to low barriers to entry, specifically in the sawmilling sector as outlined in Chapter 4 of this thesis. Gabon's production profile cannot be explained by the behaviour of each product's international market price. Still, it might be a function of national legislation, i.e. the introduction of the Forestry Code, and/or a result of domestic producer capabilities. More specifically, producers assessed their performance as mostly insufficient to meet EU buyer standards but to be better than Chinese buyers' expectations.



Gabon receives capital from China in a combination of three vectors namely trade, FDI and aid, some of which is directed towards the forestry sector. It is widely believed that Chinese companies (in Africa) do not comply with Western standards of local sourcing, provision of adequate working conditions, as well as with environmental standards as outlined in previous chapters (Chapter 1 and 4). It might thus be that Gabon's forestry sector is also being transformed due to the influx of Chinese companies (next to changes induced by dominant buyers, industry governance and national legislation), with a different general agenda than European-owned companies, which have hitherto dominated the local industry in Gabon.

## **CHAPTER OUTLINE**

The first section maps Gabon's value chain graphically identifying the value-adding stages of production, starting from the forest stand up to the point of exportation. The following section differentiates between producers in Gabon according to owners' nationalities. The discussion continues with a presentation of producers and processors' profiles (differentiated for groups of producers) qua value chain participation, date of entry and company affiliations. Given the importance of Chinese logging companies' activities to the overall discussion the third section provides a detailed overview of the former. The fourth section tests differences between Chinese and non-Chinese companies introduced in the last section using qualitative data. The same section also states information about industry barriers to entry and producers' comments about the Forestry Code.

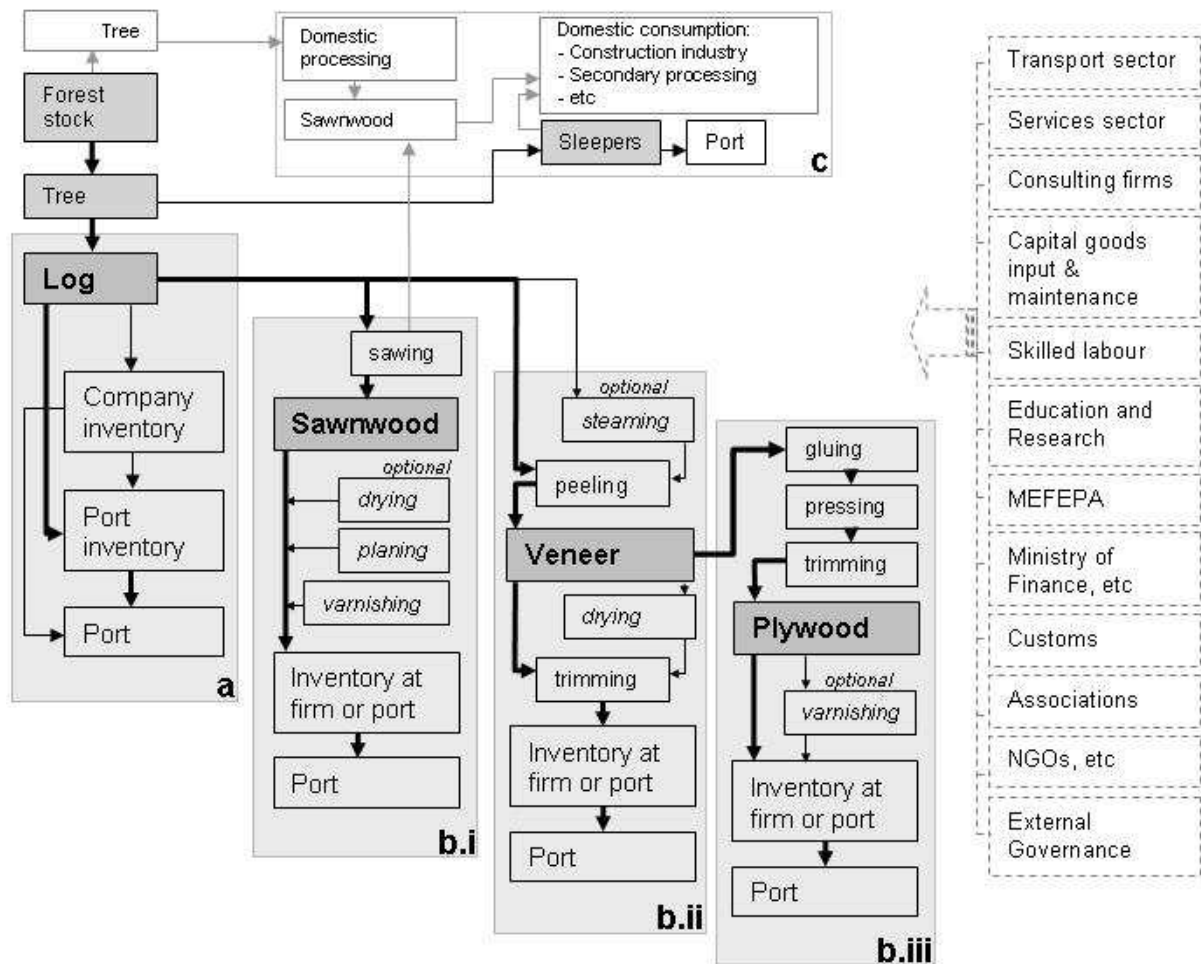
### **7.1 THE TROPICAL TIMBER VALUE CHAIN**

Mapping the tropical timber value chain enables one to identify several groups of actors that directly and indirectly make up Gabon's forestry sector. It also allows the alignment of actors according to their participation in the tropical timber value chain. In more detail, the mapping process focuses on those activities that add value to the extracted raw material and displays these processing steps in sequence to each other. Value chain actors can thus be assigned to all or specific nodes of the value chain. The domestic tropical timber value chain thus provides an overview of the structure of production. In the theoretical chapter (Chapter 2) it was said that the functional division of labour is determined by the chain's respective lead firm, or in our case final markets, thus reflecting a form of industry governance.

In Gabon, the majority of trees are either extracted from 'second-growth' forests mostly located in the

South and Northwest and applying to forests that have already been logged at least once in the past, or 'virgin' forests where previously no commercial logging activities took place. The latter 'type' of forests are often located in the Northeast and Southeast of Gabon. There are no significant numbers of plantations and/or tree nurseries in Gabon<sup>82</sup>, as the dominant harvesting system of the past, the so-called Méthode Okoumé, used to rely on the forests' own re-generating capacities (Chapter 5). The extraction of trees from the existing forest stand is the first step of the domestic tropical timber value chain sketched out in Figure 7-1.

**Figure 7-1** Domestic tropical timber value chain



**Source:** Constructed from author's data collected during fieldwork November 2008 – February 2009  
**Note:** Grey text boxes symbolise forest products at various stages of processing; thick black connectors highlight the main flows of forest products through the value chain; text boxes with dashed lines give examples of agents external to the value chain

Chain saws are used to cut trees in the forests and to remove branches off the stems. Logs are removed from the extraction site with skidders, at times assisted by bulldozers. For the removal, logs

<sup>82</sup> A couple of large companies have small tree nurseries for particular species. Although documents indicated that there might be an Okoumé plantation at an area close to Libreville, interview partners were either not aware of this plantation, or in fact were able to explain that this was a trial project, which has not been pursued for some years, and thus is currently not run on a commercial basis (Author's data).

are connected with chains to the skidders, which drag the trees along pre-prepared skid trails that run through the forests to the nearest landing. Here, loading machines are used to hoist the logs off the ground and onto trucks for further transportation. At this point the value chain starts to diverge into various sub-chains (numbering corresponds with those in Figure 7-1): a) log exports and b) further processing activities, such as the production of b.i) sawnwood, b.ii) rotary veneer, and/or b.iii) veneer plywood, as well as c) sleepers some of which are exported and some of which are, together with relatively small volumes of logs, processed and consumed locally (c).

In the majority of cases, logs are transported directly from the concessionary's landing to one of the three shipping ports of Gabon (at Libreville, Port Gentil and Mayumba). Depending on the geographic location of the landing and the port, time constraints, as well as the specific tree species, the transportation to a port might be in the form of road transportation (using trucks), train transportation, or via natural water systems<sup>83</sup>. In any case, each company's logs, as well as any logs that might have been purchased from other producers or individual concession holders, are stored before exportation temporarily at company's own inventory areas or at each company's designated inventory area at the port. There exist two types of inventory parks at the port: one terrestrial and one in the water for those species that float. SEPBG<sup>84</sup> is responsible for the admittance (including off-loading from trucks, trains and boats), stocking, and loading of logs both in the park and from the park to the ship. Yet another service company actually lifts the logs from the platform/water onto the ship (including logs shipped in containers).

The Forestry Code recommends that processing units should be in proximity to each companies' respective forest concessions: "Wood processing industries shall be located, if possible, at the area of log exploitation" (§232, Law No 016/01). It can already be noticed that recently established processing units are in fact inland and close to the respective concession areas. There are also a great number of

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<sup>83</sup> Not all species float on water, thus requiring specialised boats with large, open platforms for transportation compared to simply dragging a pack of logs behind a boat. Transportation costs vary strongly: i) road  $\approx$  XAF 75-85 m<sup>3</sup>/km (€0.11-0.13 m<sup>3</sup>/km); unit price depends on road conditions and increases with distance; often there are fixed unit base prices for common routes), ii) river  $\approx$  XAF 10-20 m<sup>3</sup>/km (€0.02-0.03 m<sup>3</sup>/km), and iii) train  $\approx$  logs XAF 60 t/km (€0.09 t/km), ppwp XAF 88 t/km (€0.14 t/km); unit costs decrease linearly with distance (Author's data obtained during fieldwork Nov. 2008 to Feb. 2009; PAPPFG, pers. comm., 2008; SETRAG, pers. comm., 2009).

<sup>84</sup> The Société d'Exploitation des Parcs à Bois du Gabon (SEPBG, Gabon Wood Stocks Exploitation Company) was established in 1986 to outsource the physical handling of logs from SNBG. SEPBG is a state-owned company and holds the monopoly on all its services (SNBG and SEPBG, pers. comm., February 2009). Service fees are a minimum of XAF 6,024 per cubic metre (€9.18) for Okoumé logs, but rise for other hardwoods to XAF 9,290 (€14.16), and to XAF 14,446 (€22.02) per cubic metre for processed wood products, plus fixed costs of a minimum of XAF 220,613 (€336) (SEPBG, 2009).

(previously established) processing units in Libreville and to a lesser extent in Port Gentil. Any log that is consumed domestically for further processing is transported from the forest landing to companies' processing units. Most often, the producers of logs also process parts of their own raw materials. However, there are also processors in Gabon, which purchase all of their raw material needs from producers as they have no direct access to the forest stock (see Section 7.2).

At companies' sawmills logs are processed into sawnwood predominantly for export markets. This activity includes the removal of bark, the measurement of each log (length, girth and defects), and the actual sawing according to buyer specifications. Processors may opt to further refine the sawnwood by drying it in a kiln (limiting expansion/contraction of sawnwood), by treating the cut surfaces with special paint to prevent infection and/or decay (phytosanitary requirement, see Sections 4.4 and 6.2), and/or by applying oils or varnish depending on buyer preferences. Sawnwood is sorted according to quality after the production process (although the quality of logs is important in determining the basic quality of sawnwood, too).

Some species, such as Okoumé (Box 6-1), have wood characteristic that allow the wood to be either sliced or peeled into veneer sheets with specialised machinery. In Gabon, most logs are peeled with either a lathe or slicer. Note that the same log cannot be used to produce both sawnwood and veneer but either of the two, which is at the discretion of the processor taking into account the log's wood characteristics at given buyer demand (Section 6.2). Depending on the 'freshness' and species of logs these can either be peeled instantly or after steaming, before a log is processed into rotary sheets of buyer-specified thicknesses. The rotary veneer may be dried to limit the wood's natural expansion/contraction. Finally, the veneer is clipped (width and length), sorted and graded.

Veneer is either exported in its current form or used to produce veneer plywood (shortened to plywood). The production of plywood entails the visual sorting of veneer (e.g. into face veneer and core veneer), the application of adhesive to the individual veneer sheets, the crosswise stacking of several sheets, and its compression. The result of this process is veneer plywood, which is then trimmed to precise buyer-specified sizes. Optionally it can further be sanded plus polished. As was true for logs, so are processed wood products transported to one of the port's inventory parks, from which they will be hosted on (container) ships.

Note that the external chain governance system is depicted in Figure 7-1 (right side, dashed boxes), too, but will not be introduced in any great detail at this point, because the most important institutions were already introduced throughout the previous chapters. For example, MEFEPA was introduced in Chapter 5 as the key enforcement state agency of the national forestry governance system. Furthermore, non-governmental organisations' (NGOs) main activities were briefly presented in the previous chapter (Chapter 6). The FLEGT programme of the European Commission was introduced in Chapter 3 and 5 as part of the discussion on the global governance system. Lastly, service sectors, other industries that feed into the tropical timber value chain and associations are discussed en route in this chapter whenever their role is vital in understanding the structure of production and/or to highlight potential differences between Chinese companies and established ones.

## **7.2 PRODUCERS' AND PROCESSORS' PROFILES**

The typical company in Gabon has the legal status of a Société Anonyme (SA, public limited company), which is owned by private stakeholders and with the dominant share in French hands. There is a 50% chance that this company also holds shares of the state-owned SNBG<sup>85</sup>. The most frequent mode of entry has been through the establishment of a new company, whose current main activities are both logging and the processing of logs into sawnwood. On average, this company employs 318 people and will have had a background in trading of (tropical) timber. A company in Gabon has on average two concession areas with a total hectare size of around 320,000. As already shown in Section 5.2 of this thesis, these concessions are usually in the process of being converted into a CFAD type (sustainable managed concession, also indicated by CPAET). Typically, a company removes 100,000 cubic metres of logs annually, of which 80% are exported and the remaining raw material processed domestically.

### **7.2.1 OWNERSHIP OF PRODUCTION**

Naturally, there is a large bandwidth of each variable around the modes as described above. With great importance to our analysis is the variable of ownership of production. Gabon's industries are foreign-dominated by large-scale operators such as Rougier Gabon (French), Rimbunan Hijau (Malaysian) and Sunly Gabon (Chinese). According to data in the Gabon Forestry Atlas<sup>86</sup> published by the World Resources Institute in cooperation with the Ministry of Forestry (MEFEPA), 52% of all

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<sup>85</sup> It is not known whether SNBG holds shares in private companies. Companies interviewed during fieldwork did not report SNBG as a shareholder.

<sup>86</sup> Makak and Mertens (2009)

CFAD/CPAET concession areas are assigned to European companies, 21% to Malaysian ones, 16% to Chinese-owned companies and 7% to Gabonese (Table 7-1, second column). However, this data, believed to have been collected in 2006/07, is inaccurate as the ownership of some companies changed over the past two years or so. Thus, adjusting the data with information obtained by the author in late 2008 to early 2009 (Table 7-1, third column) reveals that European-owned companies' share in aggregate is much smaller (roughly 40%) and that of Chinese companies as a group is higher (28%)<sup>87</sup>.

**Table 7-1** Ownership of production (percent)

	Forestry Atlas 'original'	Forestry Atlas 'adjusted'*	Ministry of Finance 'adjusted'**
Chinese	16%	28%	24%
Malaysian	21%	19%	14%
European	52%	39%	37%
Gabonese	7%	8%	10%
Others	4%	5%	3%
Unknown			12%

*Sources:* Author's data obtained during fieldwork November 2008 – February 2009; Makak & Mertens (2009), Ministry of Finance (2007); SEPBG (-)

*Notes:* \* original 'Forestry Atlas' data adjusted by author based on fieldwork data (limited to companies with CFAD or CPAET concessions), \*\* concessionary area list adjusted by author based on fieldwork data (limited to concessions ≥ 50,000 hectares)

This distribution of ownership of production in the Gabon Forestry Atlas is based on company data that hold CFAD and CPAET concessions. It is thus likely that particularly smaller companies (lacking the necessary resources to start the process of converting existing concessions as required by the Forestry Code, Section 5.2), and/or those under Gabonese ownership (e.g. as concessions other than CFAD are reserved for Gabonese nationals under the Forestry Code) are excluded. Alternatively, the distribution of ownership was calculated using data published by the Ministry of Finance<sup>88</sup> (MoF, 2007). This dataset states all concession, as well as concessionary holders' names and area sizes (year of data collection unknown).

<sup>87</sup> Based on this dataset (Gabon Forestry Atlas), the approximate sample size is around 54% (see Chapter 3), of which 22% European, 32% each Chinese and Malaysian, 3% Indian, and 12% Gabonese owned companies.

<sup>88</sup> Interestingly only after the World Bank exerted pressure on the government of Gabon, in an effort to achieve a higher degree of transparency, was a list of all concession holders plus a detailed geographic map of concessions published. These are only available through the website of the Ministry of Finance (as the state agency involved in the World Bank's Structural Adjustment programme). Efforts to obtain a hardcopy of the respective map from MEFEPA would have required a signature from the Director General. The publicly available material is outdated (but has been adjusted for this analysis), and does not highlight the fact that a significant number of individual concessions are held by members of the government, including high-ranking senior officials. One interviewee also pointed out that some concessions belong to administrative and technical staffs of MEFEPA, who have no technical expertise of managing forests (Author's observation and data collected during fieldwork November 2008 – February 2009).

As expected the percentage share of concession areas under Gabonese management of the total concession area is higher (10%) using data that does not distinguish between types of concessions from the Ministry of Finance (Table 7-1, column 4) than those restricted to CFAD/CPAET concession holders. However, when using the alternative data set around 12% of all concession areas could not be assigned with certainty to the owners' nationalities. Furthermore, small concession areas (smaller than 50,000 hectare) were excluded<sup>89</sup>. Given this lack of information it is unclear what the real percentage shares would in fact be. In our view, the current most accurate set of data are thus those published in the Gabon Forestry Atlas, when adjusted for recent changes in ownership (and keeping in mind that these data are biased towards large-scale, foreign-owned companies).

Using this corrected dataset reveals that the previous French predominance is now challenged by Asian companies, in particular Chinese- and Malaysian-owned ones. More specifically, in all cases where the data set needed to be corrected, this was because of a change in ownership, where previously companies under European- and Malaysian management are now owned by Chinese nationals (see also Section 7.3). The total concession area size that was transferred to Chinese companies in just about two years is around one million hectares. This is equivalent to 10% of the total CFAD/CPAET concession area in this dataset and thus a significant observation (especially in regards to the relatively short time span).

### **7.2.2 VALUE CHAIN PARTICIPATION**

Figure 7-2 provides an overview of companies' nationalities and the sub-chains they participate in, i.e. those activities introduced in the previous section. The majority of companies in our sample have access to Gabon's forest stock through concessions, from which they extract logs for exportation. The shares of logs that are not exported are mostly processed into sawnwood. As Figure 7-2 further shows, the production of veneer and plywood is confined to a handful of companies, of which the majority are European-owned<sup>90</sup>. One exception to this observation is a Chinese owned company, which produces both sawnwood and veneer. It should be noted though that of this companies' total processed wood products the majority are sawnwood (extracted from interview notes).

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<sup>89</sup> See Chapter 3 on research methodologies.

<sup>90</sup> The share of European-owned companies that produce veneer and plywood is understated, i.e. the owners of the only 'Gabonese' company with similar activities have in fact a dual Gabonese-French citizenship. Although they prefer to be regarded as Gabonese, their value chain activities resemble much more those of European-owned companies (hence, indicated by the serrated line in Figure 7-2).

Most companies that process logs into veneer always continue to process these veneer sheets into plywood (though some shares are also exported in its current state as veneer). In fact, half of the veneer/plywood producers concentrate primarily on these processing activities as they do not participate in the sawnwood sub-chain. In general, Chinese, Asian and Gabonese companies are active in the extraction of logs and sawnwood sub-chains. There is only one Gabonese-owned company that undertakes no processing activities.

**Figure 7-2** Ownership of production and value sub-chain activities (n = 15)

Ownership	China			Asia		EU			Gabon			Others	
Value chain activity													
Logging	█	█	█	█	█	█	█	█	█	█	█	█	█
Sawnwood													
Veneer								*					
Plywood													

*Source:* Author's data collected during fieldwork Nov. 2008 – Feb. 2009

*Notes:* Each column represents a company (and its subsidiaries); \* represents activities that are undertaken in cooperation with another processor at these processors' processing unit facilities

The sample contains only two processors with no direct access to the forest stock. During the interview, the representative of one of these two companies said, “we used to extensively trade logs in the past, but this is no longer a business option since the Forestry Code” (where only companies with concession areas are assigned an export quota). The respondent further explained that in order to gain future access to logs they had applied for a concession area at MEFEPA. The interview partner of the other company repeatedly said that over the recent years it has become apparent that they lack control over their raw material supplies. In his opinion, the company should have tried to raise more capital when it first entered Gabon in order to acquire a concession area next to the instalment of its processing unit. This is because in recent years, the company experienced timber shortages, which was ascribed by the respondent to “the increasing control of Chinese enterprises over raw materials”. Similar statements were given by respondents from a company that produces train sleepers, which reported that the specific species required for this type of wood product was difficult to source in Gabon as logs were often exported to China instead. These statements indicate that access to the forest stock is increasingly important in light of Chinese-induced resource shortages for processing industries in Gabon.



### 7.2.3 DATE OF ENTRY AND CHANGES IN VALUE CHAIN FUNCTION

Based on data collected during fieldwork, it can be established that groups of value chain actors based on nationality entered the timber industry in Gabon in consecutive waves (Figure 7-3). European-owned companies (and the one operated by owners with a dual citizenship) were the first ones starting as early as 1952, though mostly clustering around the 1980s. The first Gabonese-owned company was established as a trading company in 1976. The average year of entry is 1991. Only by the late 1990s (1997) did the first Malaysian producers enter the sector. The average 'access' year of Chinese-owned companies is 2003. Sample data from Gabon thus confirm general statements presented earlier in this thesis (Section 4.3.2), where European transnational corporations' entrance into forestry industries in the South were followed by increasing cases of South-South investments starting in the 1990s.

**Figure 7-3** Companies' backgrounds and function changes (n = 15)

Ownership VC activity	China			Malaysia		EU				Gabon			Others		
	'04	'06	'05	'97	'97	'83	'70s		'84	'88	'95	'04	'01	'00	
Logging															
Sawnwood	<b>'07</b>	'99	<b>&gt;'05</b>	<b>'06</b>	n.a.	<b>n.a.</b>	n.a.		'00s		<b>'07</b>	<b>'07</b>		<b>'08</b>	<b>'05</b>
Veneer	07						90s	99	07	99					
Plywood							90s	99	00s	04					
Trade		'99	>'05	'97	'97		'52						'76	'97	

Source: Author's data collected during fieldwork Nov. 2008 – Feb. 2009

Notes: Bold numbers indicate processing activities, which were started in the post-Forestry Code period of production; n.a. = data not available

The companies that now operate in Gabon and that entered at various points in time either had a background in the extraction of timber or in the international trade thereof. Nearly half of all companies first entered Gabon as traders of tropical timber (Figure 7-3, bottom row), compared to seven companies that entered the sector as logging companies. Only one company directly established processing units upon entrance into the sector. There appear to be only weak correlations between the value chain function at the start of companies' entrance and the nationality of these companies' owners. Whilst the majority of current value chain actors had a background related to the forestry industry, two companies (one Chinese and one Asian) were mainly known as traders of agricultural commodities. Overall, a company's background often determined its first activities in Gabon, as they continued to perform those functions, in which they had had a background before they entered Gabon.

Still, based on the dates in Figure 7-3 (and given the knowledge of companies current value chain

participation, repeated from Figure 7-2), it is possible to draw the conclusion that companies' functions changed over time. More specifically, initial traders (sometimes in the same year, sometimes considerably later) integrated logging activities to their range of value-chain activities (upstream vertical integration). Logging companies eventually established processing units (downstream vertical integration), including those logging companies that were first traders. This behaviour underlines the significance of access to forest resources for value chain actors in Gabon.

Important for our discussion on the observed increase of particularly sawnwood production (Chapter 5) is the start year of companies' processing activities. Figure 7-3 indicates for each company, in which year (or roughly at what time) they started to participate in which type of sub-chain. Overall, companies only started to process logs after the start of their logging activities, or around the year 2004. However, veneer and plywood processors started their operation in the (late) 1990s, and thus parallel to the outsourcing of processing activities from the North to the South (Chapter 4). As mentioned above, these companies are all European-owned (plus the dual-nationality company). Contrastingly, sawmills under Chinese, Malaysian and Gabonese ownership were most frequently established in 2007. In sum, sawnwood production often started in the post-Forestry Code period, whereas the processing of veneer and plywood was already initiated (mostly by European companies) before the introduction of the Forestry Code. As the value chain is buyer-driven (Chapter 6), the latter must be a result of foreign market demands.

According to the reasoning in the last paragraph, it could thus be said that EU-owned companies, first-wave investors, initially concentrated their activities on the extraction of timber and when demand from the North for tropical logs was still relatively strong. European companies in Gabon extended their range of activities to the processing level due to the changes in European consumption patterns in the 1990s. Still, although Gabonese-owned companies also entered the industry at the time when European buyers began to demand processed wood products, their value chain participation is limited to the log and sawnwood sub-chain. This contradiction is further explored in Section 7.4 of this chapter.

#### **7.2.4 VALUE CHAIN EXCLUSIVITY**

The previous section concluded that sawnwood processing activities are probably a consequence of the introduction of the Forestry Code. However, the value chain is buyer-driven and it is thus necessary

to assess the impact of foreign market demands on this value chain activity before a definite answer can be given regarding the impact of the Forestry Code's domestic processing requirements. Furthermore, it was previously stated that Southern investors, like China and Malaysia, are driven by the need to 'tap' into foreign resources given domestic resource constraints. This behaviour translates into the existence of exclusive chains between, for example, Chinese companies in Gabon and the Chinese market (Section 4.3.2). The discussion hence benefits from an analysis of companies' dominant value chain activity and the location of buyers.

On average, European-owned companies only export 38% of their total log production in its raw state, whilst using the remaining 62% as input into processing mills (Table 7-2). The largest share of tropical logs extracted by EU-owned companies is thus consumed domestically, whereas the exportation of logs is a secondary activity to these companies<sup>91</sup>. The aggregated shares for each Chinese and Malaysian companies are 70% and 30%. Gabonese-owned companies export around 90% of total log productions and thus only 10% are channelled into the sawnwood sub-chain. These companies prime activity is the extraction of logs for the export markets.

**Table 7-2** Ownership of production, value chain activities and final markets for logs (n = 15)

Ownership	China			Malaysia		EU				Gabon			
VC activity													
Logging	█	█	█	█	█	█	█	█	█	█	█	█	█
Sawnwood													
Veneer								*					
Plywood													
Log export share**	70%			70%		38%				90%			
Log export destination***	CN	CN	CN	CN	CN	EU	CN		CN	CN	CN	CN	CN
Product export share**	30%			30%		62%				10%			
Product export destination	EU	CN	SA		SA	EU	EU	EU		EU	EU	EU	-

Source: Author's data collected during fieldwork Nov. 2008 – Feb. 2009

Notes: Each column represents a company (and its subsidiaries); \* represents activities that are undertaken in cooperation with another processor at these processors' processing unit facilities; \*\* share of total log production exported unprocessed and used for domestic processing activities respectively; \*\*\* CN = China, EU = Europe, SA = South Africa is the respective main export destination for logs and processed wood products accordingly

Demonstrated through data presented in Table 7-2, China is the dominant buyer of logs for all companies (except one medium-sized European-owned one). With respect to processed products,

<sup>91</sup> It is not possible to assess whether the absolute volume of logs exported by European companies in particular (and all other sample companies in general) has increased in response to Chinese resource demands (and the knowledge of an increase of the intensive margin for the industry).

both European-owned and Gabonese companies sell the majority of their processed products to the EU market. Contrastingly, the variation of dominant buyers is more pronounced for Chinese- and Malaysian-owned companies. In other words, sawnwood producers of Chinese and Malaysian nationality dominantly trade with either/both South Africa and China. The same companies reported that they largely process those logs that were of inferior quality, for example, “we export the logs of good quality and make sawnwood of the logs that were rejected, which is around 10% of the total [log] production volume”. As a result, at least parts of the sawnwood that these processors produce is generally of lower quality, for which there is a market in China and South Africa (Chapter 6).

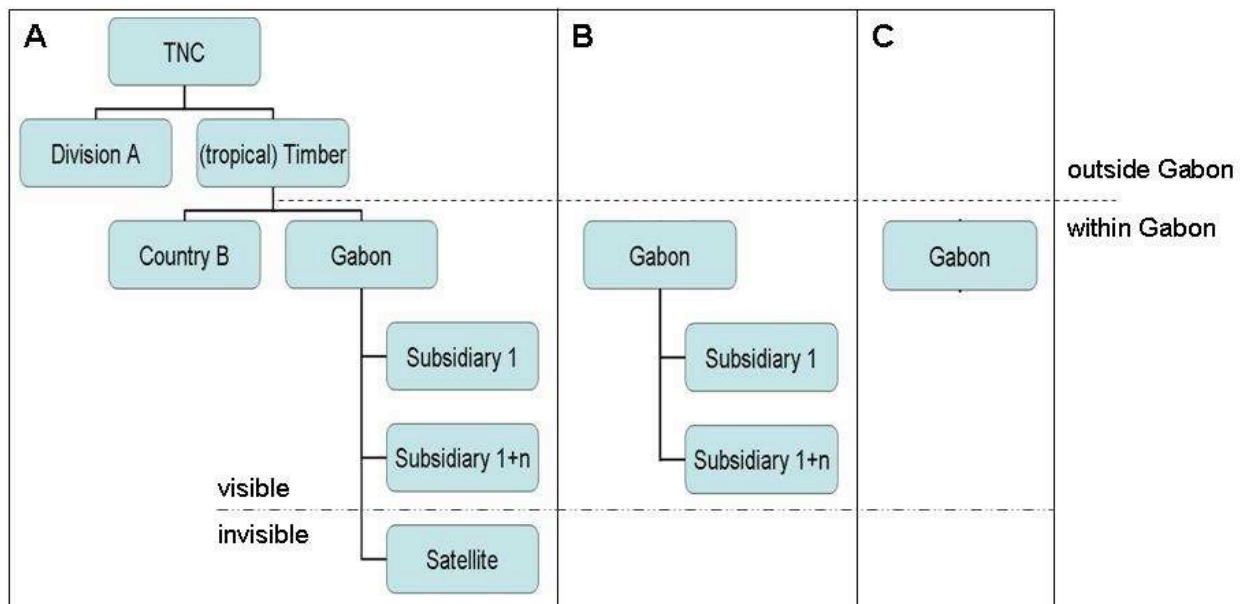
In sum, there is evidence to conclude that Chinese and Malaysian companies that entered the forestry industry in Gabon (in light of domestic resource constraints) did so during a period, where China has already been the dominant buyer of tropical timber. They thus focus their activities on the extraction of logs for the Chinese market. Yet, although Chinese/Malaysian companies also sell logs to markets other than China (not displayed in Table 7-2, extracted from author’s data), their participation in processing sub-chains appears to be a way to utilise inferior quality logs that cannot be exported. It is possible that it is also a strategy to comply with national legislation. Interestingly, the only Chinese company that produces veneer exports these dominantly to Europe. By reasoning and based on EU buyer requirements, these wood products are of medium to high quality and thus are produced specifically for the EU market (and hence are not a ‘by-product’ of their logging activities).

For mostly European-owned companies in Gabon the Chinese log market is in fact a ‘secondary’ market as the focus of their activities is on processing. Their activities are thus also driven by EU-buyers. At this moment, it would be speculative to try to assess whether given the dominance of the Chinese market (and the more facile access to this market) would induce EU buyers to change the focus of their activities, would the Forestry Code not stipulate domestic processing. Put differently, in case it were possible to choose freely between activities would the change in the dominant buyer of logs lead EU firms to leave its previous path-dependency determined by the EU market? An answer to this question (and the case of Chinese producer diversification raised above) probably depends on the profitability of each sub-chain activity and on decisions made by these EU companies’ headquarters outside of Gabon.

## 7.2.5 COMPANY AFFILIATIONS

Across all groups and within each group of nationalities, there are variations with respect to affiliations, or linkages of companies in Gabon to (foreign-based) headquarters, as well as the presence of multiple subsidiaries of a company. As highlighted in Figure 7-4, there are three types of company affiliations A) diversified transnational corporations (TNCs) with their headquarters located abroad, and with one main office plus several local subsidiaries in Gabon, B) multi-entities with one main office and several local subsidiaries, and C) single-entities that are neither associated with a TNC nor have local subsidiaries.

**Figure 7-4** Types of company affiliations



Source: Author's data collected during fieldwork Nov. 2008 – Feb. 2009

A company might decide to open local subsidiaries in Gabon for a couple of reasons. First, the maximum concession area size of a single company is limited to 600,000 hectares. By establishing multiple subsidiaries each company's concession area does not seem to count towards the area size of its Gabon office in total. It is hence possible to effectively have a total area size beyond the 'legal' maximum<sup>92</sup>. Based on available data, at least six companies hold an area size larger than 600,000 hectares when all of their publicly known local subsidiaries are taken into account. Three companies are Chinese-owned, ranging between roughly 800,000 and 1,000,000 hectares, one company is under

<sup>92</sup> The Forestry Codes (§97 states that individual concessions can vary between 50,000 to 200,000 hectares but that the total concession area assigned to the same concession holder cannot exceed 600,000 hectares (see also Section 5.2). Yet, for the largest operators in Gabon both the information about the existence of subsidiaries and the size of each concession (main office and subsidiary) are in the public domain. One can assume that it is but one example of insufficient 'political' willpower to enforce existing regulatory frameworks.

Malaysian ownership (over 1.2 million hectares), and the remaining two are French with areas of 600,000 and nearly 900,000 hectares respectively<sup>93</sup>.

In Gabon, diversified TNCs with one main office and additional subsidiaries are the most common type of company affiliation (Table 7-3). This is in fact the dominant type of affiliation for Chinese, Malaysian and European-owned companies alike. All of the Chinese and Malaysian companies have additional local subsidiaries (indicated by numbers in brackets in Table 7-3), and these in greater numbers than their European counterparts. In addition, there are cases of both multiple- and single-entity like companies among European-owned companies. The latter type is the most frequent form of company affiliation among Gabonese-owned companies. Overall, these results translate into relatively larger networks of subsidiaries around Chinese and Malaysian ‘Gabon offices’ (which in turn are related to diversified TNCs’ headquarters abroad) compared to others. European owned companies have small networks as there are few or no subsidiaries associated with the Gabon office. The majority of Gabonese companies have no networks.

**Table 7-3** Types of company affiliations and ownership of production (frequency count, n = 15)

	China	Malaysia	EU	Gabon	Others	Aggregate
A diversified TNCs	2 (3)	2 (7)	2 (1)		1 (0)	7 (11)
B multi-entities	1 (3)		1 (1)	1 (2)*		3 (6)
C single-entities			1	3	1	5

*Source:* Author’s data collected during fieldwork Nov. 2008 – Feb. 2009

*Notes:* \* company with dual-citizenship treated as European-like; A/B/C refer to types of affiliations in Figure 7-4; numbers in brackets refer to the number of subsidiaries of Gabon offices

The information about companies’ value chain activities presented earlier (Section 7.2.2) can be linked to information on company affiliations discussed in this sub-section. In other words, Chinese and Asian companies have a wider network of local subsidiaries (as well as invisible satellites, see below) and their activities largely focus on the production of logs. In some cases, they also process logs into sawnwood. By reasoning, one can thus draw the conclusion that although there are more local subsidiaries among Chinese and Asian companies, these subsidiaries’ activities are largely confined to the broadening of existing activities, rather than a deepening through increasing value added processing activities, represented by veneer and plywood production. Contrastingly, it appears that

<sup>93</sup> Calculated from quantitative data published in Gabon Forestry Atlas (Makak & Mertens, 2009, p. 29, Table 6) adjusted by company information retrieved from Groupe Rougier (<http://www.rougier.fr/>), news reports (AFP, 2010; Baillard, 2009) and other documents CBFP (2008), as well as data collected during fieldwork between November 2008 – February 2009. Numbers rounded to the sixth digit.

European-owned companies deepened their activities as they participate in all four sub-chains, with limited networks of local subsidiaries. Gabonese companies did not create networks of companies and processing activities are limited to the sawnwood sub-chain.

The data discussed in the preceding paragraph states numbers for visible companies and their subsidiaries in Gabon. However, among Chinese and Malaysian companies (including those that were interviewed by the author) there are reported ties between their Gabon offices and so-called invisible satellites. These are companies that are legally registered single-entities operating in Gabon, but which are informally linked to and often managed by Chinese and Malaysian Gabon offices (part of diversified TNCs located abroad). These single-entity companies are thus invisible subsidiaries of established Gabon offices, or effectively their satellite companies. The following section (Section 7.3) summarises allegations made by other authors with respect to Chinese companies in Gabon. It further introduces Chinese satellite companies in more detail and describes their relationship to Chinese-owned companies. Section 7.3 draws from qualitative data extracted from interviews with value chain actors and other stakeholders like NGOs, United Nations organisations, Embassies. Individual statements are not linked to its source for privacy reasons.

### **7.3 CHINESE COMPANIES AND THEIR SATELLITES**

Available reports about Chinese companies operating in the South reflect concerns about the impact of China's non-sustainable resource demand (e.g. as summarised in Chapter 1 and 4)<sup>94</sup>. For example, Stark & Cheung (2006, p. 39) write, the "future of [tropical] forests will be largely dependent on China's stance on combating illegal and unsustainable logging". An industry expert writing for the EIA (2005a, p. 5) further assessed that "China's influence in the sector encourages flagrant disregard for the law ...". Similarly, Hewitt states in direct reference to Gabon that "China ... has shown no interest in supporting efforts towards sustainable forest management (i.e. compliance with the law) by enterprises ...". He continues, "business might serve to supplement the interests of Gabon's elite as a *quid pro quo* for the latter's complicity in neglecting the social and environmental impact of China's exploitation of Gabon's mineral and marine resource" (emphasis in original; Global Timber, 2010). Indeed, the

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<sup>94</sup> Section 7.3 does not explicitly discuss the activities of Malaysian companies as according to interview partners in Gabon these are managed and integrated into the domestic forestry industry in a way that is similar if not identical to their Chinese counterparts. For example, the Rimbunan Hijau Group, a Malaysian-based conglomerate of Chinese origin operating in Gabon already has a track-record of operations in other tropical countries like Papua New Guinea. Specifically, the company has a "record of human rights abuses, environmental violations, and breaches of legislation ..." (Greenpeace, 2005; Stark & Cheung, 2006, p. 35).

'election' of the new president (the former president's son) in 2009 is considered to be like "grease to the wheels for Chinese investors" by Sharife (2009).

Detailed field reports of Chinese logging companies' actions in Gabon do not exist. Yet, a compilation of information from various sources results in an overview of some Chinese logging companies in Gabon. For instance, the Chinese state-owned enterprise Hua Jia is accused of having acquired its concessions in Gabon with fundamentally unsuitable documents, as key stakeholders were excluded, a management plan of operations did not exist, and as socio-ecological impacts were ignored (Global Timber, 2010). Furthermore, Hua Jia's concession area size stated in publications is conflicting varying from 100,000 up to 400,000 hectares<sup>95</sup>. In early 2010, the Chinese-owned company Honest Timber Gabon made headlines after its CEO was arrested in Gabon due to falsification of identity. The company is accused "of harming biodiversity in Gabon and infringing employee rights, and of sending wood from the country directly to China without checks", and whose newly acquired concession areas are "since [managed] in the murkiest fashion to the detriment of the biodiversity" (AFP, 2010; Terra Daily, 2010).

In Gabon, the general opinion amongst value chain actors and stakeholders is that all Chinese companies are directly and indirectly, through satellite companies, linked to a few big operators (including state-owned enterprises). These large companies "control an estimated 60-70% of the forestry sector through their combined concession areas"<sup>96</sup>. Due to these linkages of firms to each other (and alleged connections amongst each other), many interviewees referred to them as a "Chinese network" organised and controlled in a "Mafia"-like style. For example, it is suspect that the leading companies invest in satellite companies in order to secure log supplies, which they buy at fixed prices. Logs are also sourced from independent concession holders, where Chinese operators approached "small concession holders, who were often still indebted, with contracts that all debts would be paid in return for receiving 100% of their productions". One expert estimated that 70% of the total output from independent concession holders is collected by Chinese companies and traders.

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<sup>95</sup> In documents published by MEFEPa the concession area of Hua Jia is stated as 100,000 hectares (Makak & Mertens, 2009); other sources include IUCN (2008), Karsenty, (2007), Ministry of Finance (2007) and Naoura (n.d.). Public maps and concession holder lists were often found to contain inaccuracies, as well as to be incomplete and/or out of date.

<sup>96</sup> In some areas, such as the Northern parts of Gabon, almost all concession areas belong to Chinese and other Asian companies. These concessions were previously not assigned and do not contain Okoumé logs, which explains the clustering of concession areas in Okoumé-rich areas when France was still the dominant export market. Note that the percentage share is much higher than the 28% share calculated in Section 7.2 (which excluded satellite companies and exclusive resource sales from individual concession holders to large Chinese companies (see text)).



Especially pronounced among satellite companies is the alleged disregard of forest management and logging practices, as the Chinese logging companies "disregard the basic rules of conduct", for instance, by applying shorter rotation cycles (to satisfy current Chinese market demands), as well as through their disrespect of diameter specifications and the traditional focus on selected species. It was further suggested that these tasks are specifically assigned to satellite companies so that larger, visible, Chinese companies cannot be blamed for and implicated in any socio-ecological damages and law-conflicting activities. Additionally, interviewees believe that among satellite companies capital and the (Chinese) labour force are highly mobile and thus can be laid-off or re-settled when necessary.

Those satellite companies that were pointed out frequently, like Honest Timber Gabon, Along Sarl and Golden Eagle could not be accessed by the author. However a representative of a Malaysian logging company, often regarded as similar to Chinese companies in their operations, as part of a discussion on the profitable usage of Gabon's forest lands made a statement that supports the above allegations: "...the forests should be converted into oil palm plantations ... at least with palm trees you always make money, because you can harvest every single year; it's like a sustainable gold mine – not like the forest which you just *harvest once*" (emphasis added).

During attempts to schedule interviews with Chinese satellite companies (like those mentioned above), the author observed the presence of Chinese diplomatic cars, something often seen by some interviewees, too, and which they interpret as signs of Chinese state support and involvement in companies' actions. Indeed, many respondents said that the presence of Chinese investors in Gabon is due to the Gabonese government's "open-door policy". As a representative of a Gabonese logging company explained, "the consequences [of Chinese logging companies] are usually neglected by the Gabonese government", or in fact "guarded by the government of China and Gabon", especially "... when the right contracts between the Government of Gabon and China are signed". However, no evidence was found in support of an example of China's active engagement with Gabon's heads of states through the combination of the three vectors FDI, trade and aid (Chapter 1) Requests for clarification of this subject directed to the Embassy of China in Gabon remained unanswered.

For the exploitation of logs from the forests, many experts and chain actors believe that large numbers of necessary machinery (often copies of established manufacturers) are imported. Yet, these

statements hold for all companies operating in Gabon given the absence of complementary industries (see 7.4). Furthermore, the working conditions of Chinese labourers at many Chinese satellite companies were described to be “unacceptable” as only simple accommodation is provided, working hours are strongly regulated (10 hours, seven days a week), as workers do not have neither social insurance nor medical cover, and as wages are generally lower (an estimated €200 per month compared to an industry average of €300)<sup>97</sup>. Often the Chinese labour to total workforce ratio is estimated to be as high as nine to one. However, others think these numbers are exaggerated and to vary between types of companies. The Chinese labour share might be between 30-50% at large visible enterprises but at around 60-70% at invisible satellite companies.

Many interview partners further described a situation, where due to the entry of Chinese companies, the extensive margin is pushed outward. This comment is confirmed by secondary data (Forests Monitor, 2001; Makak & Mertens, 2009) as the maps displayed in Appendix A (pp. 239-241) show the location of concessions in the year 2001 and 2008 respectively (disaggregated to owners of production). From these maps it is apparent that especially areas in the North and Northeast of Gabon (which do not contain Okoumé and were thus uninteresting in the past) are now assigned to Chinese and Malaysian companies. Moreover, and as described earlier, existing Chinese companies widen their activities by buying established logging companies. These companies were often European-owned and were considered unprofitable by their previous owners (leading to its closure). As a result, total log supplies have increased (including a wider range of species and possible illegal exploited ones) and are now directed towards China. The presence and impact of Chinese operators' control of production in Gabon restricts supplies to non-Chinese processors (Section 7.2).

While both visible and satellite subsidiaries seem to receive active support from the Chinese government and are not (sufficiently) monitored by the Gabonese government, the strongest ‘resistance’ towards Chinese companies' activities comes from established European-owned companies in Gabon (supported by environmental organisations). The ‘EU opposition’ is due to the potential endangering of future resource supplies, disapproval of working conditions and relations to forest communities, increasing Chinese control of log supplies to processors, as well as competition

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<sup>97</sup> Where of strategic interest to them, Chinese companies seem to pay wages above industry averages, i.e. several interviewees pointed to the fact that in order to secure the transportation of logs from the forest to the ports Chinese companies pay double the industry wage rate to external lorry drivers, and over time started to set up internal transportation capacities, too. Available data does not allow for a comparison of wage rates across groups of ownership of production.

based on production costs (especially wages and environmental compliance costs) and on political influence (which is a decisive factor in Gabon). As a result of European-stimulated 'resistance', the visible Chinese companies, "started to change their attitude about a year or so ago [≈2007], but only because of extensive pressure from established companies; they [Chinese companies] would not have changed a thing without it" (representative of a Chinese logging company). Overall, "the Chinese are the new kings, who slowly control more and more of the industry", and as said by an NGO worker "[the Chinese] seriously challenge French dominance". Lastly, current actions of Chinese companies were often put into context as "they act in the same way the French did some 50 years ago".

On the one hand, many of the negative statements about Chinese companies emanate from their competitors, thus casting some doubt on the credibility of these statements. On the other hand, similar statements were made by staff working at Chinese companies, international organisations and NGOs working in Gabon, which hence provides the possibility for triangulation. Additionally, even if some statements should have been made because non-Asian companies feel that their competitiveness is undermined, by Chinese suppressing production costs, this can also be interpreted as these companies' seriousness about such factors in light of access into the EU market. In other words, it is acknowledged that environmental standards exist in the EU market but not necessarily elsewhere, and that the differences in final markets influence the activities of producers in the South. Exclusive chains governed by lead firms in either market hence result in conflicts in producer countries. For instance, the access to the forest stock and/or log supplies for further processing.

#### **7.4 INDUSTRY LINKAGES, BARRIERS AND LEGISLATION**

The discussion in the previous section showed that there appear to be clear differences between Chinese and European companies in general, and Chinese satellite companies in particular. Such satellite companies are thought to effectively act as resource suppliers to Chinese companies (and the Chinese market) in disregard of socio-environmental impacts of their alleged unsustainable logging practices. Furthermore, satellites are accused of employing large numbers of Chinese workers and to source capital goods largely from abroad. The first sub-section compares groups of companies (defined over nationalities) according to employment data and other industry linkages, as well as sustainable forest management practices. In addition, this section identifies existing industry entry barriers that help to explain specifically the value chain participation of Gabonese companies. The

section concludes with a presentation of producers' opinions about the Forestry Code and its impact on producer activities.

#### **7.4.1 OWNERSHIP AND INDUSTRY LINKAGES**

With respect to sourcing locations for necessary capital inputs, all machinery such as those to move and/or process logs, the spare-parts for the former, processing mills and other inputs (e.g. paint, glue, etc) have to be imported from abroad, either directly from the manufacturer or through an authorised sales office in Gabon. Those sales offices visited during fieldwork are owned by expatriates. With few exceptions<sup>98</sup> there is no complementary industry to provide any of the required capital inputs to the forestry sector. Results presented in Tables 7-5/6/7 thus do not come as a surprise, because all companies rely on foreign manufacturers to satisfy their need for capital goods (here exemplified by machinery, processing mills and trucks). At the same time, it explains why there are no marked differences between groups of ownership of production.

For all three types of capital goods, companies most often source these directly from abroad. Furthermore, Europe appears to be the preferred location of manufacturers of all three types of capital goods, complemented by Chinese and Asian brands. Another apparent feature of Table 7-6 is that most processing mills are directly purchased from abroad. Note that companies also purchase second-hand mills, which might explain why some Gabonese companies source their mills both from abroad and in Gabon. To some degree, company size plays a decisive role in this regard as relatively smaller companies (those with area sizes of 150,000 hectares or less) said that they often rent capital goods (or buy second-hand ones), thus limiting their reach of sourcing. In general, interviewees stated that the price-performance ratio is the critical decisive factor in their sourcing decision, followed by the quality of capital inputs and in case of machinery and processing units the after sales service (including the availability of spare parts).

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<sup>98</sup> To give an example, the author identified two manufacturers of saw blades, of which one was interviewed. The necessary input material to produce saw blades are imported from Europe. Those types of blades that are not produced in Gabon by the manufacturer (thus sourced for domestic re-sale) are imported from Europe, too. The same manufacturers/importers also provide maintenance service to companies' processing mills in Gabon.

**Table 7-4** Modes of sourcing and location of imports of machinery (frequency count, n = 9)

<b>Machinery</b>	Purchase location			Source of imports		
	Gabon	abroad	both	EU	China	Asia
China (n=2)						
				France		
Asia (n=2)						
						Japan
EU (n=2)						
Gabon (n=3)						
						Japan

*Source:* Author's data collected during fieldwork Nov. 2008 – Feb. 2009

*Notes:* Countries in shaded areas give examples of mentioned locations; Gabon as a location means that goods were purchased at sales offices of international brands in Gabon

**Table 7-5** Modes of sourcing and location of imports of processing mills (frequency count, n = 8)

<b>Processing mills</b>	Purchase location			Source of imports		
	Gabon	abroad	both	EU	China	Asia
China (n=2)				Italy		
						MAL
Asia (n=2)				France		
						Japan
EU (n=1)						
Gabon (n=3)						

*Source:* Author's data collected during fieldwork Nov. 2008 – Feb. 2009

*Notes:* MAL=Malaysia; Countries in shaded areas give examples of mentioned locations; Gabon as a location means that goods were purchased at sales offices of international brands in Gabon

**Table 7-6** Modes of sourcing and location of imports of trucks (frequency count, n = 6)

<b>Trucks</b>	Purchase location			Source of imports		
	Gabon	abroad	both	EU	China	Asia
China (n=2)				GER		
				France		Japan
Asia (n=1)						
EU (n=2)						
Gabon (n=1)						

*Source:* Author's data collected during fieldwork Nov. 2008 – Feb. 2009

*Notes:* GER = Germany; Countries in shaded areas give examples of mentioned locations; Gabon as a location means that goods were purchased at sales offices of international brands in Gabon

With respect to the input of (skilled-) labour, the sample data reveal that in general management staff are often foreigners from either the EU (mostly France), China or another Asian country (e.g. Malaysia, India and the Philippines) as shown in Table 7-7. Senior technicians, like the head of the processing unit or the head of the scouting team, are often sourced from Gabon, though foreigners from China, Europe and Central Africa are also employed in this category. Not surprisingly, administrative staff are mostly Gabonese women, whereas Gabonese and Central African men dominate the 'labourers' category, i.e. logging staff or workers at processing units. The same holds for the transportation area, where most drivers are from Gabon and neighbouring countries. Staff responsible for biodiversity protection, community linkages, certification, and so forth (here pooled under 'environment & social areas') is mostly from Gabon, although specialised European and Chinese technical staff might also be hired.

**Table 7-7** Employment details: distribution between groups of workers and workers' nationality (percent)

	Distribution of total labour	Place of Origin (% per type of labour)					
		Gabon	CA	EU	China	Asia	other
Management	7	24	4	18	38	14	1
Technicians	4	59	10	15	16	0	0
Administration	6	87	2	2	7	2	0
Labourers	74	84	13	0	2	1	0
Transport	6	70	23	1	7	0	0
Environment & Social areas	2	74	0	5	21	0	0

*Source:* Author's data collected during fieldwork Nov. 2008 – Feb. 2009

*Notes:* CA = Central Africa; excludes SNBG due to its exclusive focus on Gabonese workers and thus a distortion of results regarding workers' places of origin

Available data do not allow for a direct comparison of companies' ownership of production and the place of origin of their workforce (given a lack of disaggregated data and/or the small sample size). Instead, Table 7-7 is reproduced with exclusive data from Chinese logging/processing companies (Table 7-8). The percentage distribution of labourers' places of origin in management, technical positions, and administration rise for Chinese staff. In case of technical staff and particularly regarding administration this increase is achieved through a reduction of mostly Gabonese staff. However, due to the lack of data, e.g. it is not possible to compare 'Chinese' data with that of a similarly large European-owned company and satellites are not included in the sample, it is difficult to assess with certainty whether Chinese companies are significantly different from others. Notwithstanding the estimated Chinese labour shares in total employment raised in the previous section (up to 60-70% at satellites,

30-50% visible) cannot be confirmed or dismissed.

**Table 7-8** Chinese companies' employment details: distribution between groups of workers and workers' nationality (percent, n = 3)

	Distribution of total labour	Place of Origin ( <i>% per type of labour</i> )					
		Gabon	CA	EU	China	Asia	other
Management	5	27	6	0	58	0	0
Technicians	2	33	17	4	46	0	0
Administration	10	81	2	2	15	0	0
Labourers	71	89	6	1	4	0	0
Transport	10	74	17	1	8	0	0
Environment & Social areas	1	69	0	6	25	0	0

Source: Author's data collected during fieldwork Nov. 2008 – Feb. 2009

There are nevertheless two features that are worth pointing out. First, some of the senior management/technical positions at Chinese companies are filled with Europeans with extensive work experiences in Gabon. One interviewed elaborated on this saying that “they [the Chinese] import our expertise, work experience and our network of relations in Gabon and Central Africa, which is important for doing business here”. Most often, Europeans working for large Chinese companies are assigned ‘environmental’ tasks, such as the production of forest management plans (FMP) and implementation of sustainable forest systems, ‘social’ ones relating to companies’ interactions with forest communities, and/or were responsible for the companies’ sales department directed towards the European markets (where in turn, their Chinese/Asian colleagues are responsible for all Asian sales).

Secondly, it is critical to mention that all companies interviewed in Gabon (supported by secondary sources like OECD (2003, 2007) and Wunder (2003) report a lack of both skilled and semi-skilled Gabonese labour. The situation was often described to the author as follows: “We would like to fill our senior positions with Gabonese, but as we cannot find skilled labour in Gabon we often hire people from other Central African countries” or simply as “Gabon lacks skilled labour”. The existing (un-skilled) labour pool was judged to being not motivated, e.g. “Gabonese labourers need a change of attitude”, or in fact as being “lazy”. At the opposite scale, a French-Gabonese interviewee praised his Chinese colleagues as having “very, very good work ethics” and as being “smart and hard working, which is not even comparable to other Asian countries”.

Almost all interview partners representing logging and processing companies in Gabon did not feel

comfortable to discuss their financial situation with the author. Still, from the few available qualitative data it seems likely that financial capital is imported just like capital goods and highly-skilled labour (and especially required by smaller companies). For instance, one medium-sized company said that “in general, it is really difficult to get credit from Gabonese banks, and ours is backed by the AFD [Agence Française de Développement]”. This statement was confirmed by another small-sized company whose representative stated that, “capital is not available from Gabonese banks as they only concentrate on large companies”. For many companies, advance payments are an effective tool to overcome cash flow problems. Interviewees from logging companies generally agreed that “Chinese buyers provide advance payments much more readily and faster than EU buyers”.

#### **7.4.2 OWNERSHIP AND ENVIRONMENTAL CERTIFICATION**

Sustainability and legality standards have started to become qualifying performance criteria to EU buyers. Thus, the raw material inputs used to produce processed wood products for the EU market should come from forests that are sustainably managed and should conform to all legal domestic regulations. An indicator that measures the forest management systems applied by industry in light of sustainability and legality is the uptake of third-party certification; particularly the FSC sustainability certificate, the OLB legality certificate and the ISO 14001 environmental management standards (Chapter 6). Companies in Gabon with a certificate from any of the three groups are presented in Table 7-12. All of the listed companies are in fact subsidiaries of European-owned diversified TNCs and large-scale private enterprises.

However, Leroy Gabon (listed in Table 7-12, OLB rows) and its parent company Plysorol, a formerly French-owned plywood company in France, were recently purchased by a Chinese national Guohua Zhang, who also owns Honest Timber Gabon<sup>99</sup>. Given reports on the silviculture practices applied at Honest Timber Gabon’s concession areas (see Section 7.3) the author contacted Bureau Veritas, the responsible accreditation body of the OLB certificate. The organisation stated that “OLB certificate of Leroy Gabon has been suspended on March the 19th, 2010” as the monitoring audit failed to take

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<sup>99</sup> In April, news appeared that described the failure of Chinese-owned Honest Timber Gabon to pay staff both in France (Plysorol, now also owned by the same Chinese person) and Gabon (Honest Timber Gabon), resulting in Gabonese workers ‘bossnapping’ Chinese management staff to secure payments. Note that the author whilst in Gabon contacted Leroy Gabon (then under French management), where the request for an interview was declined as “we are in real trouble due to the Crisis [global recession]; I do not have time to talk to you as our French boss is visiting and we have to prepare”.



place, now pending further inspections within a year of the data of suspension (Bureau Veritas' letter to the owner was attached to the e-mail correspondence, received April 26, 2010).

**Table 7-9** Sustainability (FSC), legality (OLB) and other environmental (ISO) certification in Gabon

Type	Company	Area (ha)
FSC – Forest Management	CBG - Compagnie des Bois du Gabon	568,543
	CEB - Compagnie Equatoriale des Bois	616,700
	Rougier Gabon / CIFHO	688,262
FSC – Chain of Custody	CBG - Compagnie des Bois du Gabon	
	CEB - Compagnie Equatoriale des Bois	
	CPBG - Compagnie des Placages en Bois du Gabon	
	Rougier Gabon*	
OLB	CBG - Compagnie des Bois du Gabon	352,100
	<b>Leroy Gabon</b>	270,299
ISO 14001:2004	GIB - Gabonaise Industrielle des Bois	
	CEB - Compagnie Equatoriale des Bois	
	Rougier Gabon	

*Sources:* Data extracted from Chevalier (2009), databases from FSC (<http://www.fsc-info.org>), Keurhout (<http://www.keurhout.nl>) and Bureau Veritas (<http://certification.bureauveritas.fr>), company websites relating to the DHL Group (<http://www.dlh-group.com>) and Groupe Rougier (<http://www.rougier.fr>), as well as online articles accessed through the world wide web ([www.goforwood.info/en/news.Php?id=27699](http://www.goforwood.info/en/news.Php?id=27699); <http://www.gabonmagazine.com>), all accessed November 2009

*Note:* The FSC Chain of Custody and ISO certificates are awarded to processing units and companies respectively and thus no area sizes can be stated

An alternative indicator of companies' forest management styles is the type of concession, as formally only CFAD concessions signal that a company has undertaken detail environmental and socio-economic studies of their concession area, plus that these are managed sustainably (see Chapter 5). In our sample, all companies either already have converted their concessions into CFAD types, or are currently in the process of doing so, represented through a CPAET concession type. However, this stands in contrast to existing reports based on interviews with various actors in Gabon, who generally accuse Chinese producers (particularly satellites) of disregarding national regulations. Drawing from the preceding discussion on types of Chinese companies and their activities in Gabon, fieldwork data collected by the author (including company names of supposed Chinese satellites) and data extracted from the Gabon Forestry Atlas (Makak & Mertens, 2009), listing those companies that have either a CFAD or CPAET concession, it is possible to say that only the visible Chinese companies have actively started to make the necessary changes to applied forest management systems. Those referred to as satellite companies are not mentioned in the official CFAD/CPAET concession holder list, thus appearing to not be applying sustainable management systems.

### 7.4.3 INDUSTRY BARRIERS TO ENTRY AND COMPANY SIZE

There are several barriers to entry to the tropical forestry industry. One of these barriers is the access to the forest stock. This is because it enables companies to control the supplies of logs for exportation and for any in-house, domestic processing activities (Section 7.2). Related to this is the quality and location of the forest stand, and thus the quality of logs and the species that can be extracted. For instance, Okoumé does not grow in the north-eastern parts of Gabon. The geographic location of the concession area determines the species mix (Okoumé grows only in some parts of Gabon) and the distance to the port, which is of essence given high transportation costs (see below). Additionally, the size of the concession area itself is of significance due to its positive correlation to production and the existence of economies of scale. Experts interviewed in Gabon consider a forest area smaller than 50,000 hectares to be insufficient to allow for profitable productions<sup>100</sup>. Instead, an economic optimal concession area size is thought to be at least 300,000 hectares large.

The second set of entry barriers is comprised of the availability of financial capital, technical expertise, skilled labour and knowledge of the industry (including contacts to other actors in Gabon, as well as buyers abroad). Financial capital is assigned the highest weight by interviewed value chain actors, due to the necessity to invest in equipment to undertake logging activities and to move/transport logs to the ports for exportation. In general, production costs fall into four categories each comprising 25% of total costs, namely i) forest management (taxes, logging, storage, infrastructure), ii) inputs (machinery, gas/petrol, labour), iii) transportation (domestic), and iv) customs (all duties and fees at the port/for exportation, plus phytosanitary certificate). The above-mentioned scale economies thus derive from the fact that even the smallest concession area requires a minimum set of machinery.

Yet, interviewees also reported that larger companies in general have an easier access to capital than smaller companies, who often rely more heavily on buyers' advance payments for cash flows (in the absence of adequate banking systems and products in Gabon. Technical knowledge and skilled labour have to be largely imported into Gabon (see above) and thus are easier accessible with financial capital at hand. Lastly, smaller companies find it more difficult to comply with national legislation, especially the transition towards new types of concessions (requiring detailed assessments of the

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<sup>100</sup> The industrial concession type PFA, which is reserved for Gabonese nationals, has an upper limit area size of 50,000 hectare. The author did not investigate the sustainability of companies holding a PFA concession; however, the 'fermage' tenure system (see Chapter 5) arose due to concession holders' inability to profitably manage their forest stand individually (see also Box 7-1).

forest stock, etc) and the requirement to process wood domestically, which again calls for the availability of machinery, processing mills, skilled labour, and capital. Moreover, it is often reported that the design of certification schemes like FSC are discriminating small-scale producers because of the significant capital requirements to implement the necessary changes, as well as for the actual certification process (Chapter 3).

**Table 7-10** Ownership of production and company size (expressed through concession area, workforce and log production, n = 12)

Size	Concession	Workforce	Production
Ownership of production	(ha)	(no.)	(logs, m <sup>3</sup> )
China	532,000	357	160,000
Malaysia	620,486	380	*
EU	493,000	657	175,000
Gabon	174,000	230	52,400
Others	150,000	150	50,000

Source: Author's data collected during fieldwork Nov. 2008 – Feb. 2009

Note: \* Workforce and production data of Malaysian companies are incomplete and thus excluded

Based on aggregated sample data, Gabonese companies on average have concession areas totalling 175,000 hectares, and thus well below the 'optimum' rate of 300,000 hectares stated above (Table 7-10). Additionally, it was mentioned previously that many independent concession holders are Gabonese with area sizes of less than 50,000 hectares (so-called *petits permis*). All other three groups of owners of production hold concession areas around the 500,000-hectares mark, with Chinese-owned companies dominating in size<sup>101</sup>. The relatively larger concession areas associated with foreign-owned logging companies, allows these operators to produce roughly three times more than the log volume of Gabonese-owned companies. The larger overall workforce of European companies is believed to be a result of the nature of data, i.e. employment figures include workers at processing mills, of which there are larger capacities at European-based companies (see below).

There are no significant differences between foreign-owned companies qua size, but rather between the latter as a group versus Gabonese companies, especially in comparison to the so-called '*petits permis*' (Box 7-1), which are significantly smaller, and thus face greater barriers to entry regarding

<sup>101</sup> The author applied the same calculations to secondary data, i.e. concession area sizes stated in the Forestry Atlas (Makak & Mertens, 2009), limited to companies with CFAD/CPAET concessions, and log export volumes disaggregated to companies retrieved from SEPBG for the year 2008. While the overall result, especially with respect to the relatively weaker production capacities and concession area size for Gabonese-owned companies, have not changed, the absolute numbers of the group averages are different: China (675,000 ha), Asia (350,000 ha), Europe (326,000 ha) and Gabon (143,000 ha).

(access to) logging and processing activities. It is for this reason that Gabonese producers might have foregone the opportunity to develop processing capacities during the period when France was the dominant buyer and started to demand increasing volumes of processed wood products (as pointed out in Section 7.2)

**Box 7-1** Individual or 'petits permis' concession holders

In Gabon, there are hundreds of so-called 'petits permis' (small licence) concession holders of forest areas most commonly around 10,000 hectares. Some of the 'petits permis' holders may use these areas for domestic or communal consumption only. Still, the largest groups use their concessions as a source of income by either selling their extracted raw materials to the industrial sector, i.e. logging and processing companies, as well as traders buying on behalf of domestic and foreign buyers of logs, or by renting the concession out to domestic logging companies. The latter tenure system is also referred to as 'fermage' (see also Chapter 5). In individual cases large logging companies would also rent equipment to the 'petits permis' holders, to enable the extraction of logs and its transportation to the domestic buyers. A profitable management of small concession areas is not feasible due to the capital investment required for equipment and labour.

The 'fermage' system has also been used for rent-seeking purposes as small-scale concession areas were given to politicians and government staff as political pay-offs or to redeem political favours. Taxes on these concessions were often not paid and contributed to the weak tax revenue recovery of the government. Given the increasing efforts to introduce more transparency to the sector, it is unclear how this will change the 'usage' of concessions for political purposes. Based on concession holder lists and maps, it appears that many 'petits permis' areas were actually transferred to large-scale logging companies in recent years. Most are thought to supply logs to Chinese companies and traders.

The European-funded project PAPPFG targets specifically 'petits permis' holders in order to support their transition towards profitable small-scale forestry management and sustainable production. For this purpose, individual plots are grouped together so as to achieve economies of scale as a group of producers. Furthermore, the project provides technical and financial assistance given the lack of expertise in forest management systems, as well as debts and lack of access to adequate financial services. At times, the work also includes the support in reaching formal contractual loan agreements between the 'petits permis' and large-scale logging companies.

*Source:* Author's data obtained during interviews with key stakeholders, producers and processors in Gabon during November 2008 to February 2009, PAPPFG, pers. comm., 2008

#### **7.4.4 IMPACT OF NATIONAL LEGISLATION ON VALUE CHAIN PARTICIPATION**

Several interviewees said that the reason for their 'upgrading' efforts, i.e. the establishment of sawnwood processing facilities next to the extraction of logs, is the national regulation stipulated in the Forestry Code that by January 2012 25% of total log production can be exported whilst 75% has to be

processed domestically. One company representative said that “one of the most important national regulations is the processing requirement ... we put up new facilities and bought existing ones to meet government criteria”. Others said, “we are expanding the production of processed woods to reach the 75% quota”, “we started to process logs in 2006 due to the Forestry Code”, and “our processing unit started in 2008, and we are installing a second one that will start production in 2009, to increase the processed products share of total exports”.

However, as discussed above, the choice of the type of processed wood products is often limited to sawnwood. As a Chinese producer explained, “plywood is too complicated for us so we focus on sawnwood”. The same message was given by a Malaysian producer who said that “we consider peeling logs but right now sawnwood is easier”. More generally speaking, an owner of small-medium sized company said that “the new government policy for industrialisation and sustainable development discriminates SMEs, as financial means and technical expertise are required that are only available to larger companies”.

Another interviewee highlighted the technical ‘flaws’ of the processing regulations, because “the 25% and 75% shares are based on an ideal rate for Okoumé logs and its 20 to 30 year rotation cycle ... other species require longer rotation cycles of an optimum of 50 to 100 years and are much more difficult to process”. From a cost point of view a company which already processes relatively large amounts of logs domestically said that “we can achieve 50% [i.e. processed log shares] but anything beyond that is not profitable; ... For every one percent increase in processing our production costs double”. An industry expert confirms that the “industry likes logs because they are easy to cut and transport (...) products have to be handled more often and are more expensive to produce”.

An additional constraining impact of regulations anchored in the Forestry Code is the limitation of log productions due to production quotas assigned to companies (and most commonly perceived as export quotas). One company which used to focus on trade simply said that “we can no longer trade with logs as we don’t have a production quota because we have no concession”, and a respondent in a European-owned company said, “the export quota has in general constraining effects”. A Malaysian producer further thought, “the export quota is a political decision ... We want to increase productions but cannot as we are not given a higher quota, which is set by the Ministry who favours certain

companies". One processor further explained that "I now have three options; I can sell logs for direct cash, or I use the logs to produce veneer and plywood for a long-run income; ... I have the flexibility to re-focus production according to buyer demand and in case of problems but the Forestry Codes takes that flexibility away".

The existing rules regarding logging rotation cycles and minimum diameters were often criticised, too. French management staff at one company said that "the regulation is based on an ideal rate thought up in the EU, which is not appropriate for Gabon. In Gabon, the rotation cycle of the past decades was always sustainable". This statement is echoed in another statement: "the rotation cycle only works for Okoumé but other species require much longer cycles ... if the 20 or 30 year cycle is applied to all species the standing volume will decrease in time destroying the forests for short-run profits". Some producers felt that there is a "lack of political willpower and commitment to support the introduction of sustainable forest management in Gabon" as "there is a lack of monitoring of logging activities", or "there is no cooperation between private industries and the government ... We do not get support for sustainable forest management and receive no credits or subsidies from the government". One Gabonese interviewee described the situation as follows: "Government regulations are a joke as nothing is monitored and the system is totally corrupt".

During an interview with a French producer/processing company a statement was made that summarises the major external impacts on Gabon's industry best: "The industry changed quite drastically since 2001, due to the introduction of the Forestry Code, most importantly the processing requirement and the new types of concessions, certification requirements from abroad [the EU market], and the entrance of Chinese companies particularly over the past five years [around 2002/03]". Given the weak governance system in Gabon, most European-owned company representatives felt that certification of activities in Gabon by foreign bodies would send a positive signal, and would actually be better as certification criteria are more stringent and better audited: "the national regulations are already covered by our FSC certification ..., for example, the minimum diameter of Okoumé is 70 centimetre under Gabonese law but we apply an 80cm-rule as demanded by FSC", or "the FMP [forest management plan] is a good thing as it forces companies to protect the environment but certification should be extended so that sustainable methods are applied in all of Gabon".

## 7.5 CHAPTER SUMMARY

The previous sections demonstrated that Chinese (and Malaysian) companies do not differ from those owned by Gabonese and Europeans across a number of variables such as size and domestic linkages, particularly capital goods and capital. Yet, Chinese companies generally have large networks of local subsidiaries. Some of these local subsidiaries are directly (and visibly) linked to large TNCs, while others, here referred to as 'satellite' companies, are indirectly linked to the same TNCs. Chinese satellite companies' activities are restricted to the extraction of logs from the forest stand, which they sell to Chinese TNCs in Gabon (often at fixed prices). Effectively, the visible Chinese companies have thus widened their logging activities through their linkages to satellites. Moreover, it was commonly asserted that Chinese companies allegedly transfer environmentally harmful practices to satellites, as well as that working conditions at satellites are below the industry standard.

Overall, Chinese companies focus their activities on the extraction of logs for the Chinese market. The strong bias towards processing of sawnwood among visible Chinese companies is a result of domestic processing requirement compliance, the utilisation of inferior logs, and an absence of capabilities to process plywood. The strong demand from China for resources in combination with the increasing control over resources by Chinese companies, which dominantly trade with China, has led to a resource supply shortages for domestic processors. Compared to the past, activities undertaken at visible Chinese companies have notably changed due to pressures exerted by existing (European) companies. In other words, silviculture methods, moves towards higher degrees of employment of domestic labour, and so forth have started to be more aligned to existing Gabonese industry conducts. These unwritten norms have largely been shaped by the 'first' wave of investors whose activities are determined by European market demands.

It is important to mention that there is one Chinese company that has started to produce veneer for European markets. This companies' visible behaviour qua value chain participation, but also the usage of log tracking devices (accepted tool in support of a chain-of-custody certification, both legality and sustainability) and participation in international stakeholder forums (all extracted from interview notes) demonstrates that this producers' activity is probably independent of ownership, but driven by foreign markets. Still, at this moment it cannot be judged whether this is an exceptional behaviour or an example of a 'first-mover' company that may represent how Chinese companies in Gabon could

change their value chain participation (and industry integration) given a change in their dominant markets and thus industry governance.

Companies under Gabonese ownership have a constraint participation in the tropical timber value chain, i.e. their activities are often restricted to logging and the processing of sawnwood. Apart from SNBG, the state-owned former export monopoly, the small size of Gabonese companies might be an explanatory factor of why these companies appear to take advantage of Chinese market demands for logs. In other words, due to industry barriers to entry both at the extractive and processing levels, next to a lack of Gabonese skilled labour and capital constrains, Gabonese companies could not build up the skills and capacities to undertake value-adding activities. Yet, existing capacities of Gabonese companies seem to be sufficient to serve the Chinese market with logs. Anecdotal evidence shows similar problems relating to economies of scale for small-scale companies across groups of owners of production. Put differently, apart from smaller Chinese and Malaysian logging companies, which are allegedly part of a larger network, any other (independent) company faces the same difficulties as Gabonese companies of similar size. According to interviewees, one of the consequences was the closure of smaller companies in Gabon over the past years (some of which are now under Chinese/Malaysian ownership).

European-owned companies (generally large) participate in logging activities, next to the processing of veneer and plywood. Yet, while these activities are considered higher-value adding activities, with implied positive impacts on industrialisation and employment, it appears to conflict with Chinese buyer requirements for large volumes of logs. This apparent conflict can be explained by the mixed chain participation. In other words, large European companies export some of their raw materials to China but dominantly orientate themselves towards the processed wood market in Europe (independent of the introduction of the Forestry Code). The trading relationships with European markets also explain these companies' more active engagement in environmental and legality documentation measures. Nonetheless, the participation in various sub-chains directed towards two markets with different market standards has resulted in a situation where only some forest concessions are certified but not all, depending on the volume demands of each market.

In general, markets (buyers' performance criteria, environmental and other standards) dominate over



ownership of production as a determinant of companies' activities. Given the earlier entrance of European companies into Gabon's forestry industry, i.e. at a time when France (or Europe in general) was the dominant markets, their activities were largely shaped by the latter. In contrast, Gabonese companies that appear to struggle to access the EU market due to domestic barriers to entry as well as companies from China and Malaysia, who entered the industry at a later stage, undertake activities geared towards the Chinese market and thus are determined by Chinese market standards.

Current value-chain participation is additionally influenced by the introduction of the Forestry Code, especially regarding domestic processing requirements. Amongst others, the legislative framework is believed to restrict an expansion of extractive industries and to impede with the flexibility of production across sub-chains. Sustainable forest management requirements are said to increase production costs (for those companies that aim to comply with the given regulatory framework), though producers do not receive technical and/or financial support from the government and are uncertain whether investments (e.g. to obtain a FSC certification) are compensated by a price premium. Many producers think that the current legislative framework is insufficiently adjusted to account for a wide range of tree species, and that compliance is poorly monitored. As was concluded earlier, the Forestry Code is seems to be the single factor that led to an increase in sawnwood production.

The following chapter investigates how the change in industry governance due to shift in final markets of logs affects the intra-chain income distribution. Put differently, data are presented that depict the value-added at each node of production in the four sub-chains, and the respective surplus that accrues to companies in each chain. Results from this discussion can be interpreted using the concept of economic rents introduced in Chapter 2 of this thesis. The discussion continues with a theoretical exercise, which simulates the impact on factors of production should companies be forced to participate in a single log sub-chain exporting to China or any of the three processing sub-chains directed towards Europe.

## CHAPTER 8 INTRA-CHAIN INCOME DISTRIBUTION AND SIMULATION

### EXERCISE

Chapters 5, 6 and 7 illustrated the decisive influence of final markets on the nature and structure of the timber value chain in Gabon. But this is not the only factor affecting the value chain. The domestic legislative framework that aims to stimulate domestic processing activities in light of employment creation and industrial upgrading towards higher-value-added functions has led producers to concentrate some of their activities on the sawnwood sub-chain, which is characterised by low export prices (compared to export prices of veneer and plywood) and by low barriers to entry. It is due to the latter, namely low barriers to entry, that one should expect these activities to generate relatively small surpluses. The same reasoning applies to many commodities, where entry barriers are low and where international prices traditionally decreased over time.

Yet, as was shown in Chapter 5, the price of tropical timber has increased in time, and this rise has been further accentuated by the non-marginal impact of consumption of China. Chinese industries import logs on an unprecedented scale that feed into its processing industries, whose output is both consumed domestically and exported to the OECD. Another immediate consequence of China's consumption pattern was a re-direction of traditional tropical timber trade flows globally and in the case of Gabon. As a consequence of Chinese resource demands production of tropical logs in Gabon rose beyond any historic level. This is achieved both through an increase of the intensive and extensive margin of production (the latter partly due to the influx of Chinese producers and the allocation of new concessions to them).

This Sino-driven continuation of the exportation of raw-materials conflicts with rising European market demands for processed wood products. While Gabon's processing industries expanded over time its aggregated export share is still far lower than that of the extractive log sub-chain sector. Yet, on a country basis, France's total import volume of processed wood products calculated in roundwood equivalents, i.e. the amount of logs used for the production of processed wood products (231,000 cubic metres), is now larger than the quantities of unprocessed tropical logs of 219,000 cubic metres<sup>102</sup> (see

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<sup>102</sup> Data extracted from Forestry Trade by the Food and Agricultural Organization of the United Nations (<http://faostat.fao.org>) accessed August 2010, converted into roundwood equivalents using author's data collected during fieldwork (November 2008 – February 2009).

also Section 5.4.1). Similar calculations for China's imports show that processed wood products are around 40,000 cubic metres (in roundwood equivalents) but over one million cubic metres of logs.

## **CHAPTER OUTLINE**

The first section of this chapter estimates the value added at major nodes of production for each of the four existing sub-chains. The discussion is based on an analysis of the intra-chain income distribution with the help of an indexed input-output table. The discussion highlights those activities that generate a surplus and those that do not, as well as the underlying reasons for this situation. The second section asks 'what-if' questions like "what if all of Gabon's timber is exported as logs?", and "what if all of Gabon's timber is exported as either sawnwood, veneer, or plywood?". This is an artificial exercise, since these options represent an unreal choice. Moreover, veneer is an intermediate product for the plywood industry rather than an alternative product. However, the use of these stylised options helps to explore the consequences of major shifts in global demand arising from the change in the nature of consumption of the major countries driving the world economy. To illustrate this issue, we simulate the impact of each form of production specialisation on employment, capital costs, foreign exchange, and factors of production.

### **8.1 INTRA-CHAIN INCOME DISTRIBUTION**

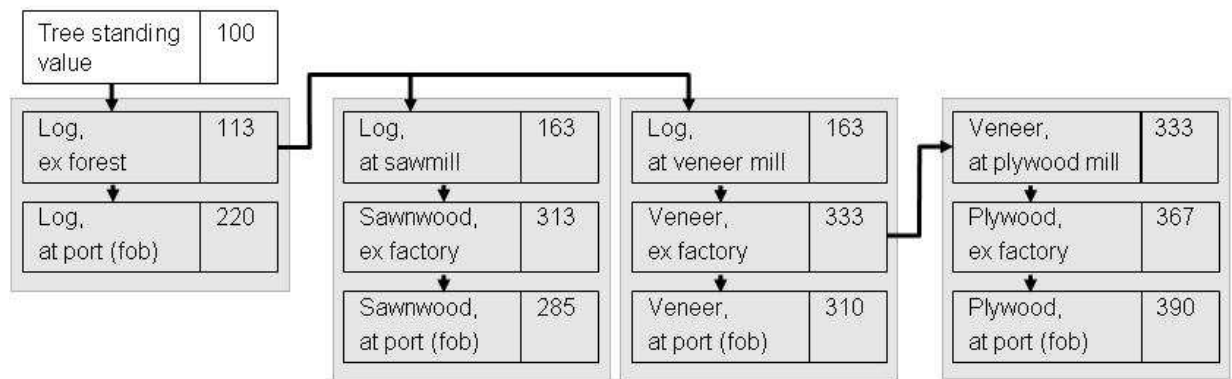
Some of the literature using the global value chain (GVC) framework seems to equate value-adding nodes of a value chain with positive producer margins. For example, studies (e.g. Dolan & Humphrey, 2000) that use final sales prices of products at various stages along the value chain equate an observed 'price escalation' with a respective increase in producer margins at downstream activities of the value chain. As Gibbon et al. (2008, p. 331) summarise, "the question ... [of] how and by what processes ... value is distributed ... [was] initially almost exclusively in terms of the shares of final prices associated with different links in given chains", where "value ... [is a] reflection of differences in shares of final prices". Here, value accretion is thus seen as synonymous with surplus maximisation. However, these discussions do not take production costs into account, which would result in a distribution of profits along the chain.

Yet, in reference to the value chain framework (Chapter 2), lead firms that have the power to determine the functional division of labour of the value chain they control, only perform those activities for which

they achieve a positive profit margin, and/or those where rents can be achieved. Rent appropriation was said to occur most commonly at downstream value-adding activities (like marketing and branding). These nodes of production are protected from competition by barriers to entry set by the lead firm. Next, given the lead firms' deterministic influence on the functional division of labour along the chain, the intra-chain income distribution is equally a result of chain governance. Put differently, as each node of production earns a profit and may allow rent appropriation, the 'allocation' of chain functions by lead firms determines the profit earning possibilities of value chain actors at each node of production (though most often excludes the option of rent appropriation).

With respect to the specific case of Gabon, using an index of the value of logs and processed products after their respective points of production, as well as the point of exportation (i.e. fob value at port), results in a general overview of the value-addition throughout Gabon's tropical timber sub-chains, depicted in Table 8-1. The value chain starts at the forest level where the standing value of a tree is assigned an index value of 100 points. Once the tree is felled, cleared off its branches and transported to the forest landing site there is an increase in its value to 113 index points. The transportation from the landing site (ex-forest) to the port results in an index point value of the same log of 220 points.

**Table 8-1** Intra-chain value-added distribution



Source: Author's data collected during fieldwork Nov. 2008 – Feb. 2009

Overall, the added value due to processing of logs into sawnwood, veneer and plywood follows the expected profile as the index values of each product at the point of exportation (fob value at port) are 285, 310 and 390 respectively, compared to the log export index value (at port, fob) of 220. In other words, extracting and transporting logs from the forest to the port adds value to the log as it can now be sold for consumption abroad (in contrast to an inaccessible tree in the forest), but even more value can be added to the raw material by processing it, where deeper processing activities result in higher

value-added indices, i.e. an increase of 107 index points for logs, of 172 index points for sawnwood, of 197 index points for veneer, and of 277 index points for plywood (Table 8-2).

**Table 8-2** Value-added and producer margins of logs and wood products (index points)

	Value-added <i>(fob value at port minus log value ex-forest)</i>	Producer margin <i>(fob value at port minus log/product value ex-forest/ factory)</i>
Log	107	107
Sawnwood	172	-28
Veneer	197	-23
Plywood	277	23

Source: Author's data collected during fieldwork Nov. 2008 – Feb. 2009

Still, there are two anomalies in Table 8-1 that do not appear in the value-added column of Table 8-2 (second column). First, making logs available for consumption to foreign industries is assigned a higher index value increase (107) than doing the same but for the domestic processing industries. Here the difference between the logs ex-forest index value and the processing mill index value (similar at saw and veneer mills) is 50 points. This means that exporting logs adds more value than selling logs domestically. Secondly, the producer margin, defined as the log/wood products at port (fob) value minus production cost, are in fact negative for both sawnwood (-28 index points) and veneer (-23 index points), marginally positive for plywood (23 index points), but the highest for logs (107 index points) (Table 8-3, third column).

In more detail, by transporting logs from the forest, where it has an index value of 113 points, to either a saw- or veneer mill increases the value of this log by 50 points to an index of 163. The finished wood products have an ex-factory index value of 313 and 333 for sawnwood and veneer respectively. Using the veneer to produce plywood further increases the index value of the ex-factory plywood by 34 points (plywood, ex-factor value is 367). Yet, at the moment where any of the three wood products enter international trade as they are sold and exported abroad, their respective fob index values at the port in Gabon are insufficiently high (sawnwood 285, veneer 310) or small (plywood 390) to cover the cost of production, which have now been taken into consideration. In sum, although value has been added to each product, the actual unit profits are highest for producers who export logs, and thus undertake no processing activities.

Producers and processors in Gabon are hence faced with a situation where EU-buyer demand stimulates the processing of resources in the country of origin, but where the processing activities are not profitable or relatively small as in the plywood sub-chain. At the same time, trade data suggest that plywood production has traditionally been at a low level and has recently been falling, whilst sawnwood production has risen sharply throughout the last years. This is a conflicting situation, where Chinese and Gabonese companies in Gabon produce logs for the Chinese market (at the highest available producer margin), while European-owned companies in Gabon appear to have developed strong linkages to the EU market, where processors struggle to produce profitably. It appears that sawnwood and veneer processing activities are financed through the exportation of logs.

Taking into account information presented throughout the previous chapters, in particular industry entry barriers, allows one to draw conclusions regarding the existence and appropriation of rents. The Gabonese state is the sole owner of its forest ecosystems (FAO, 2006a). The existing regulatory framework restricts access to the forest stock through a concessionary system. Moreover, prices of tropical timber, determined by the international supply (contracting) and demand (increasing) situation, rose over time. These two factors result in Ricardian resource rents at the upstream end of the value-chain, which are appropriated by logging companies with forest concessions. Although production costs are described to be high in Gabon relative to neighbouring countries and other top producer countries, and despite the fact that global prices are suppressed through illegal exploitations and trade, these variables only lead to a reduction of the resource rent derived from a bounty of nature. Contrastingly, additional domestic production costs that arise during processing (both at mills and transportation) and the absence of barriers to entry, particularly in the sawnwood sector, results in the dilution of resource rents. Only the plywood sector somewhat profits from restricted access to this activity, i.e. processing technology and know-how, as well as skilled labour shortages.

From this analysis of value-added distribution, producer margins and rent, three main points arise. First, the main reason why processing activities increased relatively sharply for sawnwood is domestic policy, which in turn was influenced by pressure from external governors. Policy formulation was based on the goal to industrialise the forestry industry and to create employment in this sector. Secondly, with the various processing options, Gabonese producers are least inefficient in plywood and most uncompetitive in sawnwood. Logging companies are protected from competition due to restrictions to

Gabon's forests. Thirdly, the significant demand for tropical logs from Chinese industries conflicts with the government concept of expanding local value-added (possibly equated with rising profit margins), yet re-enforces a functional division of labour that is in fact the most profitable sub-chain option from the point of view of producers in Gabon.

## **8.2 SIMULATION EXERCISE**

The shift in Gabon's dominant export market or the shift in key global buyers, essentially amounts to a 're-orientation' of the domestic forestry industry towards logs versus an initially European-induced increase of processing activities (later followed by the requirements set by the Forestry Code). In the following simulation exercise, Gabon's total log production is assumed to be either exported exclusively to China in the form of logs, or to be completely absorbed by domestic processing industries, which produce a single type of wood product for exportation to Europe. Each of the processing sub-chains take the necessary production and processing steps that precede it into account, i.e. in order to produce any type of wood product, logs need to be extracted from the forest and transported to processing mills first. Likewise, the discussion of the plywood sub-chain includes activities at the forest level (extraction and transport) plus at the veneer processing level as plywood is made from veneer sheets.

### **8.2.1 SIMULATION I – FIXED INPUT VOLUME, CURRENT ENDOGENOUS VARIABLES**

Over the past years (2003 to 2007), Gabon has produced a fairly constant amount of logs of around 3.4 million cubic metres. For the moment, we assume that this is indeed a sustainable rate of production. The log quantity (abbreviated to roundwood equivalent, RWE) is held constant in this exercise and is the raw material input into either of four possible sub-chains. The processing of logs into wood products inevitably creates wood wastages, for example, as bark is removed and as logs are cut into evenly sized sawnwood thus not utilising the rounded, outer parts of logs. In consequence, a given unit of input always results in a smaller unit of output of processed wood products (thus referred to as real output). In Gabon, these so-called average rates of conversion (ARC) of logs are 0.49<sup>103</sup> for sawnwood, 0.51 for veneer and 0.43 for plywood. With the exception of plywood, the ARCs in Gabon

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<sup>103</sup> This number is an average of various rates of conversion depending on the type of tree species, sawnwood specifications and quality level of the final product. For example, the ARC of Okoumé sawnwood for the European market is 0.45, but that of other hardwood species is 0.36 (average ARC 0.41 for EU-sawnwood). The ARC of Okoumé sawnwood produced for the Chinese market, i.e. rougher cut and lower quality, is 0.75, whilst that for other hardwood species is 0.4.

are lower than the global averages of the tropical timber industry, e.g. 0.56 for sawnwood and 0.53 for veneer (Global Timber, n.d.-b.; UNECE, 2005).

In the case of the Chinese market absorbing the full production volume of logs of Gabon, all 3.4 million cubic metres of logs are exported to China. Considering the species mix exported to China (53% of Okoumé and 47% of other hardwoods) and the respective international prices<sup>104</sup> for each (group of) species, the possible foreign exchange earnings to producers in Gabon are slightly over US\$ one billion (Table 8-3). Earnings achieved through the processing of logs into sawnwood for the European market are considerably smaller than those for logs, amounting to a fall of nearly 30%. It is only for the veneer and plywood sub-chains that foreign exchange earnings are enhanced by around 11% and 13% respectively. Note that log and wood product prices were discussed in Chapter 5, where it was established that prices of higher-value added products are higher than those of logs. Consequently, the foreign exchange earning results are a reflection of differences in real output, i.e. the lower quantities of veneer and plywood compared to logs are 'compensated' through price. Such a form of clearing cannot be observed for sawnwood thus signalling processing inefficiencies.

An argument often brought forward in support of domestic processing deepening is the favourable impact on employment. There are substantial gains in additional employment<sup>105</sup> of processing activities compared to those at the forest level (Table 8-3). In more detail, an extra 14,000 jobs are created when all logs are processed into sawnwood. Slightly more than 15,000 additional workers could find employment at veneer mills and close to 17,000 in the plywood sector. The total employment figures (taking into account employment at required preceding activities) of processing logs into plywood are more than six times higher than those for logs. A still substantial three times as many jobs (total employment) are created in the sawnwood (factor of 2.84) and veneer (factor of 3.04) sectors relative to the logging sector. It can be seen from these numbers that plywood production is relatively employment-intensive.

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<sup>104</sup> The prices used in our calculation are averages of the years 2003 to 2007. Later years were not considered as they were either not available for all variables used in our simulation, and as to avoid the exceptional impact of the Global Recession on some of the variables. International prices of Gabon's species other than Okoumé are not fully recorded and thus not available. As a substitute, the price of Sapele, also reported in UNCTAD's Commodity Price Bulletin, is used as a proxy for these tropical logs. All prices are reported as FOB unit prices, i.e. in USD per cubic metre.

<sup>105</sup> The timber industry suffers from the small size of Gabon's labour pool and a lack of skilled labour (Chapters 5 and 7). A feasible translation of these labour related variables cannot be achieved, e.g. as data on current possible vacant positions for either or both reasons in each sub-chain are not available. A second best alternative used here is a reduction of simulated employment figures by 20%, which is equal to the current share of non-Gabonese labour (Author's fieldwork data collected Nov. 2008 – Feb. 2009).



**Table 8-3** Outcome of Simulation I – fixed quantity of log inputs

Item	Abbr.	Unit	China	Europe		
			Log	Sawnwood	Veneer	Plywood
RWE <sup>a</sup> Input	O <sub>RWE</sub>	m <sup>3</sup>	3,430,000	3,430,000	3,430,000	3,430,000
Real Output <sup>b</sup>	O <sub>R</sub>	m <sup>3</sup>	3,430,000	1,370,000	1,750,000	1,490,000
Foreign exchange <sup>c</sup>	FX	m USD	1,050	750	1,170	1,190
Employment <sup>d</sup>	L	number	7,400	21,000	22,500	47,100
Capital <sup>e</sup>	K	k USD	39,900	74,800	428,700	730,400
Capital productivity	O <sub>R</sub> /K		146.4	31.2	6.9	3.5
Labour productivity	O <sub>R</sub> /L		465.1	65.4	77.8	31.7
Capital intensity	K/L		5.4	3.6	19.1	15.5

*Sources:* Author's data collected during fieldwork Nov. 2008 – Feb. 2009, Commodity Price Statistics by the United Nations Conference on Trade and Development ([www.unctad.org](http://www.unctad.org)) accessed November 2009 and July 2010, ForesSTAT by the Food and Agricultural Organization of the United Nations (<http://faostat.fao.org>) accessed November, December 2009, Nguema (2007) and Odysée Développement (2005)

*Notes:*  
a RWE = roundwood equivalent  
b Converted using ARC for Gabon based on interview data, when necessary adjusted for species mix and final destination, at fixed RWE input levels  
c Prices weighted for species mix and averaged over the period 2003 until 2007  
d Based on 2004-2006 sectoral employment averages extracted from Nguema (2007), and output figures retrieved from ForesSTAT; numbers corrected for skill deficiencies (see footnote 105)  
e Based on 2003 capital depreciation costs across chains as stated in Odysée Développement (2005), converted into USD using the average 2003 exchange rate (<http://data.un.org>)

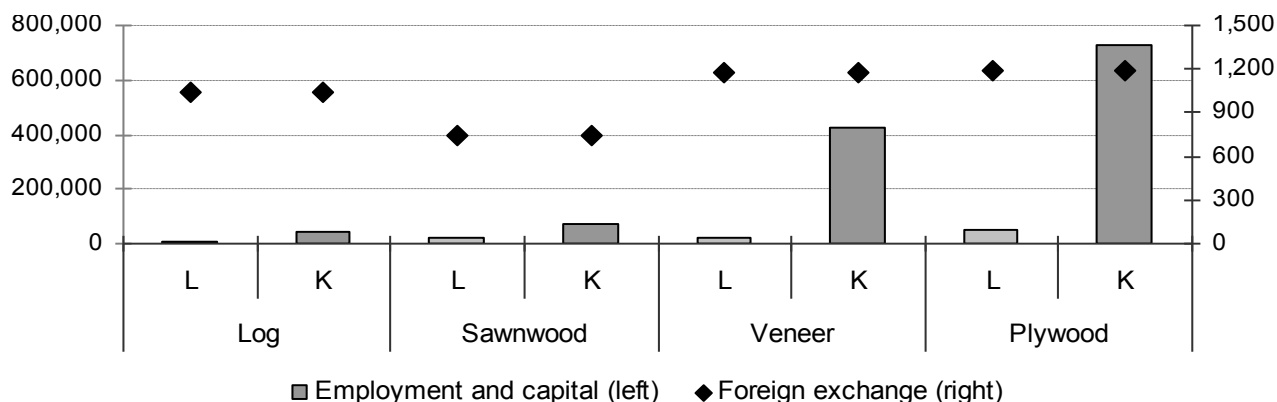
The capital costs required to allow processing activities to take place vary considerably. The capital costs are US\$75 million for sawnwood compared to nearly US\$430 million in case of veneer and up to US\$730 million in the plywood sub-chain (Table 8-3). While the estimate of capital costs are abstract based on sub-chains' depreciation costs<sup>106</sup>, a comparison across all chains (using the same calculation method) shows huge differences in potential investments that producers and/or processors in Gabon face. For example, the capital costs of plywood processing activities are eighteen times higher than those for the extractive sector, and roughly ten times higher than those of the sawmilling sector. In short, a rise in employment due to a deepening of processing activities is only made possible by rising capital investments, graphically displayed in Figure 8-1. At the same time, foreign exchange earnings based on the export of veneer and plywood improve only marginally relative to those achieved by trading with logs, and are lower for sawnwood.

The previous section (Section 8.1) presented producer margins for each sub-chain: 107 index points for logs, -28 index points for sawnwood, -23 index points for veneer and 23 index points for plywood. Assuming that logs are to be processed, a continuation of processing of veneer into plywood is thus the only financially viable option. Still, as discussed in the previous paragraph, following through with

<sup>106</sup> Data of capital replacement costs, the usual proxy for capital, are not in the public domain and could not be retrieved during fieldwork. The second best data disaggregated into all four sub-chains were sectors' average capital depreciation costs, reported by Odysée Développement (2005) for the year 2003.

this option nearly doubles the capital costs, increasing from US\$430 million to US\$730 million. This very large increase of capital costs due to a deepening of processing activities is a significant industry barrier of entry, or in fact, an all-too-real barrier to entry as reported by management staff of especially small-to-medium sized companies in Gabon (see Section 7.4). Given these obstacles to entering the plywood sub-chains (which also requires the participation in veneer processing and logging (i.e. according to the discussion in Chapter 7 the access to the forest stock is increasingly important), producers' preference for logs is a financially sound decision.

**Figure 8-1** Levels of employment, capital, and foreign exchange for Simulation I



*Source:* Constructed from Simulation I results assuming RWE of 3.4 million cubic metres per annum  
*Note:* Employment in numbers, capital in USD thousand, foreign exchange in USD million

With the introduction of the Forestry Code in December 2001, and its domestic processing requirements of up to 75% of total log production by January 2012, the timber industry was essentially forced to move away from hitherto profitable logging activities mostly into the sawnwood sub-chain. When faced with the decision to undertake processing, the relatively high industry barriers to entry both in the form of skill requirements and capital costs associated with particularly plywood (and thus veneer) processing activities, consequentially led to an expansion of the sawmilling sector. It seems likely that capital investments and probable losses generated due to existing negative producer margins are currently balanced through trade with logs<sup>107</sup>.

With respect to the productivity of the two factors of production considered in this exercise, capital and labour, these are each substantially higher for logging activities than any of the processing options

<sup>107</sup> Likewise, losses in the sawnwood and veneer sub-chain accruing to European producers/processors are balanced by profits from the exportation of logs and production/export of plywood. Note that the previous Chapter quoted one interview partner, who critiqued that Forestry Code regulations are constraining his flexibility to choose between multiple sub-chains (or actually the weight he assigns to each at particular points in time) depending on market demands and global prices. It can thus be assumed that losses in one sub-chain are reduced by increasing production/export of other activities.

(Table 8-3). It is clear from Gabon's low rates of wood utilisation that the sawnwood and veneer processing sectors are inefficient from an international perspective due to their low average rates of conversion. In economics terminology, log production is a 'superior technology', since it has higher factor productivities for both capital and labour than each of the three alternative uses of timber. In the context of high unemployment rates in Gabon (Chapter 5), it is notable that the capital cost per job is lowest in sawmilling, and highest in veneer processing.

### **8.2.2 SIMULATION II – FIXED INPUT VOLUME, ADJUSTED ENDOGENOUS VARIABLES**

The international price of logs and processed wood products is an exogenous variable in our analysis. Still, some of the variables in the simulation exercise can theoretically be influenced, such as the rate of wood utilisation (or ARC) and capital costs. The same holds true for labour, where the size of the potential labour pool and the skill set of these workers could be influenced in a way beneficial to the timber industry. In our model higher rates of processing efficiencies are represented through an improvement in conversion rates (a result of both changes in technology and labour capabilities). For this reason, the ARCs applied in Simulation I (0.41 EU-sawnwood, 0.51 veneer and 0.43 plywood) are substituted with global industry averages (0.56 sawnwood, 0.53 veneer and 0.43 plywood). Capital costs are assumed to fall uniformly by twenty percent<sup>108</sup>. Lastly, employment numbers are no longer corrected for the presence of deficiencies in skill capacities among the domestic workforce. Hence, an assumed influx of skilled Gabonese labour into the industry is simulated by the abolition of the previous 20% reduction in employment figures (see footnote 105).

Because of the adjustment of wood utilisation rates (ARCs) the real output of sawnwood (39%) and veneer (3%) increase compared to the first simulation (Table 8-4). The real output of the plywood sector (9%) increases, too, yet this rise is due to an increase in veneer input volumes as the current plywood ARC of Gabon is already equal to the global industry average. Indeed, the internationally competitive wood utilisation efficiencies in the plywood sector is the reason why a three percent increase in veneer quantities lead to a higher percentage increase of total plywood real outputs. The

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<sup>108</sup> This percentage was selected randomly (though set to reflect the increase in employment efficiency) and is not based on real estimates, e.g. a potential reduction in costs due to changes in import freight costs in case more capital goods could be sourced locally.

relatively sharp rise in sawnwood productions should not come to a surprise given that the sawmilling sector is the least efficient one based on the actual ARC relative to the respective global average<sup>109</sup>.

**Table 8-4** Outcome of Simulation II – fixed quantity of log inputs, adjusted variables

Item	Abbr.	Unit	China	Europe		
			Log	Sawnwood	Veneer	Plywood
RWE <sup>a</sup> Input	O <sub>RWE</sub>	m <sup>3</sup>	3,430,000	3,430,000	3,430,000	3,430,000
Real Output <sup>b</sup>	O <sub>R</sub>	m <sup>3</sup>	3,430,000	1,910,000	1,810,000	1,630,000
Foreign exchange <sup>c</sup>	FX	m USD	1,050	1,030	1,210	1,300
Employment <sup>d</sup>	L	number	9,200	33,000	28,700	62,200
Capital <sup>e</sup>	K	k USD	31,900	70,700	352,900	615,800
Capital productivity	O <sub>R</sub> /K		162.6	40.8	7.7	4.0
Labour productivity	O <sub>R</sub> /L		372.1	58.0	62.9	26.1
Capital intensity	K/L		3.9	2.4	13.8	11.1

**Sources:** Author's data collected during fieldwork Nov. 2008 – Feb. 2009, Commodity Price Statistics by the United Nations Conference on Trade and Development ([www.unctad.org](http://www.unctad.org)) accessed November 2009 and July 2010, ForesSTAT by the Food and Agricultural Organization of the United Nations (<http://faostat.fao.org>) accessed November, December 2009, Nguema (2007) and Odysée Développement (2005)

**Notes:**  
a RWE = round wood equivalent  
b Converted using *global* ARC, when necessary adjusted for species mix and final destination, at fixed RWE input levels; plywood totals are calculated applying a rate of 0.9 (extracted from OD) to veneer outputs as otherwise changes in the input volume (veneer) would not have been reflected  
c Prices weighted for species mix and averaged over the period 2003 until 2007  
d Based on 2004-2006 sectoral employment averages extracted from Nguema (2007), and output figures retrieved from ForesSTAT; numbers *not* corrected for skill deficiencies  
e Based on 80% of the 2003 capital depreciation costs across chains as stated in Odysée Développement (2005), converted into USD using the average 2003 exchange rate (<http://data.un.org>)

As a consequence of higher production quantities in all three sub-chains, foreign exchange earnings in these sectors increase, i.e. expressed in percentages, potential earnings rise by 39% for sawnwood, 3% for veneer and 9% for plywood (Table 8-4). The equal percentage increase in production and foreign exchange earning is because Gabon's industry is a price taker, i.e. prices are set by the international market. As in the previous simulation, the foreign exchange earnings of sawnwood (US\$ 1.03 billion) remain at a lower level than that of logs (US\$ 1.05 billion), thus signalling the persistence of the relative un-competitiveness of this sub-chain. Sawnwood real output volumes would have to increase significantly more in order to offset the relative discrepancies to foreign exchange earnings of logs (at a lower relative price than sawnwood but at a higher export volume). However, this is the case for veneer and plywood, where relatively lower production volumes are offset by comparatively higher unit prices.

<sup>109</sup> As noted in Chapter 7, this gap is partly due to the fact that some producers in Gabon often process only those logs that were rejected by buyers. The simulation assumes that all logs of all quality levels are processed, and thus it is reasonable to assume that less wood is discarded because of log deficiencies such as splits.

The gain in employment figures in the sawnwood sector is substantial as there is an increase of around 56%. The percentage increase in total employment in the veneer sector is 28%, whilst that in the plywood sector (incorporating gains at veneer mills) is close to 32%. The additional employment figures (or net employment not considering employment at required preceding activities) are 23,600 in the sawnwood sector, 19,500 in veneer processing activities, and nearly 34,000 at the plywood sub-chain. These numbers reflect an influx of Gabonese skilled labour and a rise in production volumes in each sub-chain. Employment numbers at the extractive industry increase by a quarter. The total sawnwood workforce is thus four times as large as that in logging, three times larger compared to the veneer sector, and nearly seven times higher in the plywood sub-chain compared to the logging industry alone<sup>110</sup>.

Nevertheless, positive effects in the number of workers employed at processing industries have to be put into perspective by also considering capital costs (Table 8-3, Figure 8-2). In other words, while employment figures in the sawnwood sector increase by 256% (relative to logs), the associated capital costs increase by 122%. In the veneer sector employment increases of 212% are achieved by an increase in capital costs of more than one thousand percent. Similarly, the plywood sub-chain (employment increase of 574%) is based on an increase of capital costs of 1,830%. A reduction of capital costs by twenty percent (and an increase in labour by the same percentage) does not alter the general outcome of the previous analysis<sup>111</sup>, i.e. employment creation requires heavy investments from private industries into capital goods. Overall, such investments in the sawnwood sector are not justified, as the foreign exchange earnings are lower than those of logs are. The relatively higher earnings in veneer (15%) and plywood (24%) could provide the necessary funds, yet this cannot be said with certainty at this point.

None of the changes regarding capital, labour and processing efficiencies (ARCs) lead to significantly different results of the productivity of factors of production, nor the capital costs per job (K/L). The hypothetical productivity of capital increased whilst that of labour fell in each case across all four sub-

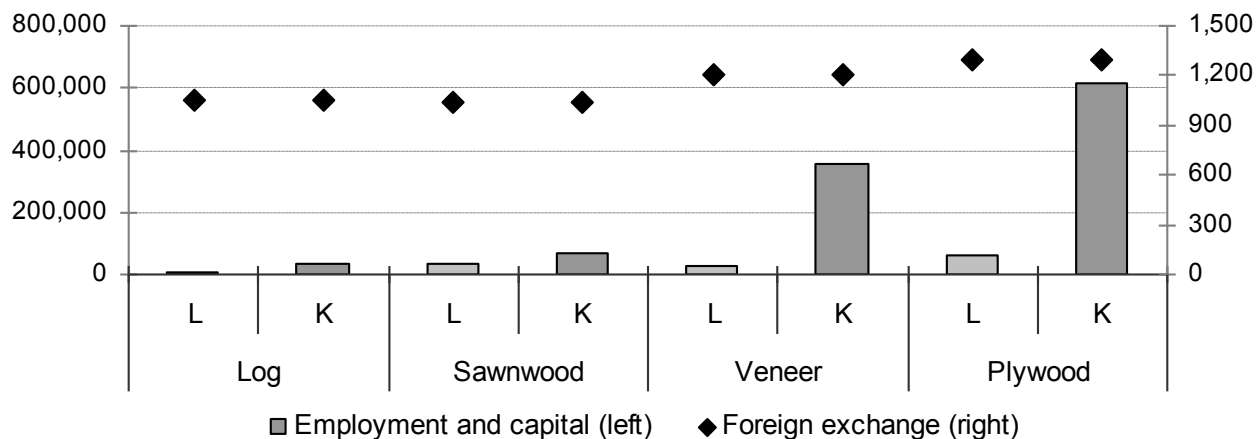
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<sup>110</sup> Employment intensities have not changed. Note that economies of scale, should they exist, were not incorporated in the simulation. Employment is capital dependent as both logging and processing activities are predominantly activities that require capital goods (like chainsaws and mills) with a maximum absorption rate of labour per capital good. This is also the reason why an increase in processing activities is a step-wise process, with each step achieved through the instalment of a new processing mill.

<sup>111</sup> It should be noted that the result of the estimate of capital costs in this simulation compared to the first one depends on the assumed reduction in capital costs. For instance, assuming a reduction by only ten percent results in an expansion of sawnwood processing activities that would require additional capital needs that outweigh the assumed fall in capital costs, i.e. total investment costs would rise to US\$79 million (compared to US\$75 million in Simulation I). Simulated capital cost requirements in all other sub-chains are more robust (i.e. in comparison a reduction of ten, twenty or thirty percent does not change the overall outcome).

chains (Table 8-4). In relative terms the productivity of capital and labour is still significantly higher when channelled into the log sub-chain compared to utilising them in any of the three processing sub-chains. The economic ‘superiority’ of log production persists. The capital cost per job (measured by capital intensity) decreased across all four sub-chains. In comparison, it is still the lowest in sawmilling, followed by the logging and plywood sectors, and is highest in the veneer sub-chain.

**Figure 8-2** Levels of employment, capital and real output for Simulation II



*Source:* Constructed from Simulation II results assuming RWE of 3.4 million cubic metres per annum  
*Note:* Employment in numbers, capital in USD thousand, foreign exchange in USD million

The exercise cannot be extended to simulate changes in producer margins, due to the nature of the collected data, where an index system of net values was used rather than unit sales prices at each node and respective production costs<sup>112</sup>. Furthermore, disaggregated production cost data are only available from two companies. As a result, changes in production costs are difficult to estimate, as it has to be assumed that capital costs fall, whereas employment numbers rise, thus leading to an increase in labour costs. It is not possible to judge the total effect on production costs. Furthermore, expenditures on domestic transportation, customs, taxes, environmental compliance, and so forth make up the bulk of total production costs. These are all exogenous items that are outside of the influence of individual producers (and this simulation).

### 8.3 CHAPTER SUMMARY

By its very nature, the simulations undertaken in the previous section are crude and simplified. Still, whenever possible the few variables that were used in the first simulation were adjusted in the second one. For example, to reflect how the rates of factor utilisation were to change if the industry could reach

<sup>112</sup> Price and production costs data were not shared with the author during the majority of interviews. This led to the introduction of indices and net values instead (see also Chapter 3).

higher levels of efficiencies, the rates of conversion, where more of the input log is preserved during processing, were higher in the second simulation. Additionally, capital costs were reduced by twenty percent whilst that of labour was increased by the same percentage. Despite the adjustment of variables, the general conclusions drawn in the first simulation persisted in the second simulation. Moreover, simulation outcomes for all variables across sub-chains in each simulation were significantly different. This outcome suggests that the results are robust, thus providing the necessary confidence to discuss the impact of the simulation results in the context of developmental issues and industrial policy (Chapter 9).

In general, the outcome of each simulation exercise has not produced evidence to support a concentration of industry activities on processing. This assessment is a result of high foreign exchange earnings and the highest positive producer margins (Section 7.1) associated with the exportation of logs, but negative (or small) surpluses across the processing sectors. Although in the earlier simulation exercises foreign exchange earnings through processed wood product exports were at times higher than those of logs, results clearly showed that achieving these earnings requires large capital investments. The same 'trade-off' exists for employment, where an expansion of employment is based on an increase in investments. For instance, an increase of employment by a factor of seven due to an expansion of plywood productions (Simulation II) would require capital investments to increase by a factor of 19 compared to those necessary in the log sub-chain.

The results are a consequence of two factors. First, Gabon's industry works at a sub-optimal level, mirrored in low wood conversion rates, high production costs, lack of skilled Gabonese labour, and other macroeconomic and infrastructure factors affecting costs (Chapter 5). In this chapter, these distortions are expressed through relatively lower rates of productivity of the factors of production capital and labour, and higher rates of capital intensity at the veneer and plywood sectors. Though these inefficiencies exist across sub-chains of the tropical timber industry, high resource rents in extractive industries are able to absorb these inefficiencies, whereas these are diluted in most processing activities except for the plywood sector, where barriers to entry exist with respect to skilled labour, technology, knowledge, and high capital costs. In short, the comparative advantage of Gabon's forestry industry thus lies in the availability of natural resources rather than in other factors of production.

Secondly, the results are a direct consequence of the shift in final markets and the replacement of France as the dominant export market. This is particularly because of Chinese processing industries needs for significantly larger volumes of logs. In other words, the total roundwood requirements from Europe (thus taking into account current log and processed wood raw material inputs) are smaller than Chinese log requirements alone. It would seem from this that there is little short-term 'development logic' or private profitability inducements to downstream value added. Yet, whilst in the past economic deepening was largely a result of simultaneous occurring foreign investments and European market demands, current processing expansions are a largely a result of the existing policy regime. In the concluding chapter (Chapter 9) we will consider the desirability and viability of the policy-induced programme of downstream processing.





## CHAPTER 9 CONCLUSION

This dissertation is anchored to the disruptive impact of China's resource-based economic growth over the last two decades. In the introductory chapter we observed that whilst the country's economic expansion is often labelled a 'miracle' it has not been unique in comparison with other countries' economic performance at similar stages of development. In general, based on assessments of China's export growth rates and global export shares (Prasad et al., 2004; Kaplinsky, 2006a), as well as with respect to structural changes measured by the shift in labour away from agricultural to industrial activities (Holz, 2008), China follows a path trodden by other economies before. China's industrialisation pattern is based on a comparative advantage following strategy (Lin & Wang, 2008). Furthermore, at low levels of per capita income, it is going through a resource-intensive phase of growth (Farooki, 2010; Radetzki, 2006). The size of China's population, at an estimated 20% of the world total, negates the small-country assumption inherent to macroeconomic trade models, and for this reason its growth affects that of other economies.

Over the past decade, commodity prices increased sharply and over a longer period than in previous price booms in the years 1951-53 and 1972-1975. The recent commodity boom unfolded because of unanticipated shifts in demand met by low inventories of supply, i.e. it has been a result of China's non-marginal impact of consumption (Farooki, 2010; Goldstein et al., 2006; IMF, 2006, 2008; Radetzki, 2006). The commodity boom during 2003-08 is thus an effect of China's resource-intensive growth and of its weight in the world economy. Since the onset of the global Financial Crisis around mid 2008 commodity prices slumped over the course of just eight months (April 2008 until February 2009). Still, for most parts of the year 2009 and early 2010 the aggregate commodity price index has increased both due to "the stronger-than-expected global recovery and the increasingly important role of emerging and developing economies" (IMF, 2010, p. 29).

China's impact on other economies is increasingly recognised, as reflected in the following statement: "If you look at what has happened in terms of China's industrial activity ... it obviously has at least partly decoupled from the G7; ... economists have to spend a lot more time looking at China [and other emerging economies] than we used to because this is where the real growth is going to be, particularly for basic materials and commodities" (Morrissy, June 29, 2009). Similarly, news reports quote

commodity analysts asserting that "A lot of that [i.e. the price rise] has been driven by the sharp recovery in Chinese demand ..." (Tasker, June 29, 2010). The AIECE reports that their working assumption is one of "a world economy which continues a two-speed recovery with strong growth in the emerging economies led by China and modest upward momentum in the industrial countries" (AIECE, May 10, 2010).

The Chinese economy is generally expected to follow its resource-intensive growth trajectory in the future, or more specifically "although China's import demand growth rates have peaked or are likely to peak soon, they will nevertheless remain lower double-digit territory over the next decade [which is the time period considered in this analysis]" (Trinh et al., 2006). Based on his research, Holz (2008) suggests that China's economy is likely to continue its growth due to structural changes for another 30 years. As mentioned in the previous paragraph, this behaviour is to some degree independent of the economic situation in OECD economies. Implications, such as the seeming reversal of commodity exporting countries' terms of trade due to rising prices of primaries and falling prices of manufacturers<sup>113</sup>, are thus arguably going to continue to hold true in the future, despite uncertainties about the exact shape and duration of a global economic recovery.

This thesis used examples from the tropical timber industry in general and primary data from Gabon in particular to examine the impact of Chinese consumption of tropical timber forest products on a commodity producer industry in the South. Tropical timber is a renewable, natural resource that is of strategic importance to the Chinese economy. It is an input into domestic processing industries that produce wood products for domestic as well as for export markets. Many tropical log suppliers to China are developing countries, which also have traditional trade relationships with markets in the North. In the supplier countries, the forestry industry is regarded as having the potential for resource-based industrialisation and poverty reduction (Bazett, 2000; Westoby, 1987).

The global value chain (GVC) framework has been used as a method to study the likely changes in the organisation of production and physical trade flows. This is because in contrast to macroeconomic

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<sup>113</sup> The behaviour of the 'nominator' of the terms of trade, manufacturing prices, was not discussed in this thesis. It is noteworthy that although traditionally the manufacturing unit index (e.g. as recorded by UNCTAD) increased over time (index value in 1970 = 100 and in 2008 = 503), since the end of the 1990s there are periods of manufactures price deflation. These movements can partly be attributed to China's global impact, i.e. prices of manufactures are declining more, the greater China's participation in the respective product group (Kaplinsky, 2008; Kaplinsky & Santos-Paulino, 2006, see also Chapter 1).

trade theory the GVC framework explicitly addresses the role of industry and firm-level decisions in defining the structure of the increasingly segmented global production systems (and trade of intermediary inputs as well as final products). Key themes of the GVC literature such as the concept of governance, and related to this the role of standards and consequences for the distribution of incomes, provide a framework to analyse the Sino-induced developments. The research was further based on the theoretical discussions about the role of natural resources in economic development.

## **CHAPTER OUTLINE**

Economic theory and the analytical framework in the form of global value chain analysis were used in the formulation of research questions. The following section (Section 1) presents a summary of the thesis' research findings along these research questions and the overarching research hypothesis. Additionally, the original contributions of the analysis are highlighted. The implications of research results derived from this dissertation for theory and the global value chain framework as a research method (Section 2), industrial and economic policy formulation (Section 3), and further research (Section 4) are discussed throughout the rest of this chapter.

### **9.1 SUMMARY OF RESEARCH RESULTS**

The research hypothesis states that, given the organisation of production and trade in global value chains coordinated by dominant chain actors, a redirection of trade away from traditional buyers in the North towards the emerging economy of China will lead to transformations in the governance and organisation of increasingly Sino-driven global value chains. Changes are likely to be disruptive to existing developmental axioms. Furthermore, the growing presence of Chinese producers in Southern resource industries has the potential to accentuate structural changes in the organisation of production, because Chinese actors' activities are said to be concentrated in the extractive rather than the processing stages of production, often in disregard of socio-environmental consequences. In order to have an organised approach to answering the overarching research hypothesis the following research questions were of guidance:

1. Can we observe a significant shift in agricultural raw material trade flows that are redirected away from traditional consumer countries in the North towards China?
2. Does the Chinese market differ from established markets in the North, and how does this

translate into buyer requirements and standard setting?

3. Given the influx of Chinese capital into producer countries, are there marked differences in the activities of Chinese-owned producers and either or both domestic and non-Chinese, foreign-owned ones? Is this because of dominance of ownership of production or the ownership of final markets, i.e. are producer activities determined by nationality, markets, or both?
4. Do any of the above differences lead to significant changes in the structure and governance system of the domestic value chain?
5. What are the growth and developmental impacts arising from these changes?

### **9.1.1 SHIFT IN TROPICAL TIMBER TRADE FLOWS**

Trade data were used to evidence a shift in tropical timber trade flows from producer countries in the South away from its traditional destination of OECD countries towards China (Chapter 4). The re-direction of tropical timber trade flows is a result of three factors. First, the absolute level of consumption of tropical timber in OECD economies declined, because of a reduction in domestic processing activities. Secondly, the North cuts its consumption of tropical timber as a result of environmental concerns. Accordingly, total absolute world import volumes shrank. Thirdly, China's tropical timber import quantities increased rapidly after 1993 in tandem with rising raw material needs of its domestic wood processing industries (at given domestic resource constraints). Chinese industries' volume requirements are sufficiently large to counterbalance the previously negative trend of falling world imports. Taken as a whole relative import shares of the OECD and China almost reversed between 1990 and 2007. China is the new driver of physical tropical log trade.

As was true on a global scale, so have absolute tropical log demands by France receded since the early 1970s. France has been Gabon's traditional trade partner largely due to former colonial ties (Chapter 5). For the longest time, Gabon's production volumes of tropical timber moved more or less in line with French market requirements. China's absolute tropical timber imports from Gabon have not only increased substantially but are also far higher than any previous volume requests by individual countries, as evidenced with intra-trade data. Consequently, production increased substantially reaching record highs not recorded before. Since 1995, Gabon exports a dominant share of its total tropical timber production to China (60% in 2008), but only a small share of around 12% to France in the same year (Chapter 5). Chinese industries are the single dominant buyer of Gabon's tropical logs.

As a result, tropical log flows from Gabon are no longer directed towards its traditional trade partner France but towards China's emerging economy.

### **9.1.2 DIFFERENCES IN GABON'S MARKETS AND STANDARDS**

The Chinese market for tropical timber products differs from that in the North as both are at unequal stages of forest utilisation and resource exploitation. The forest transition model helps to explain this distinctiveness (Chapter 4). China is currently at an industrial phase, whereas most countries in the North have already entered a post-industrial phase, characterised by recurrent forest stocks, transparent and sustainable forest management systems, the harvesting of a diverse range of products delivered by forest ecosystems, as well as increasing forest areas that are taken out of timber production like national parks. In China forests have been exploited both through an increase in the intensive and extensive margin until depletion (with national legislative measures protecting remaining forest stocks). Its domestic processing industries are expanding rapidly and private consumption of tropical timber products is rising (from low per capita levels in global comparison). Among Chinese industry actors and the public, there is only a limited awareness of the impacts of non-sustainable timber consumption (in producer countries).

The Chinese and Northern markets are also characterised by diverging patterns of consumption of tropical forest products (Chapters 4, 5 and 6). The distribution of imported tropical forest products is in both cases a function of domestic processing industries. Industries in industrialised countries began to outsource labour-intensive processing activities to the tropical-forest rich South, because of rising domestic wage levels and the associated loss of competitiveness (to low-income countries in general and now China in particular). These industries thus no longer import raw materials but the processed products made thereof. Contrastingly, Chinese domestic processing industries are still expanding with respect to scale and industrial capabilities. The ability to undertake activities further downstream in the value chain accentuates and determines the overall quantities of imported input materials. China is a leading exporter of primary and secondary wood products, for which it imports significant raw materials from the tropical South.

Using primary data collected in Gabon variations of 1<sup>st</sup>-tier buyer-determined groups of standards for each China and Europe were measured (Chapter 6). Access to Europe is defined by quality of logs

and wood products, price, species selectivity, technical regulations (formaldehyde emissions and the phytosanitary certificate) and increasingly the request for legality and/or sustainable certified logs and wood products. In contrast, market access to China is more facile and depends on quantity, price and phytosanitary measures. At the moment, none of the certified environmental standards were considered to be of importance to Chinese buyers. Most noticeably, producers in Gabon differentiated markets according to the degree of domestic processing of exported products, with Chinese market requests for logs but European markets' rising demand for processed and certified wood products. Differences between the markets in China and Europe qua standards or barriers to market access are a consequence of the factors described in the preceding paragraphs, i.e. the structure of domestic processing industries, consumption patterns and market requirements for environmental and other standards, as well as each country's respective phase of forest utilisation.

There also exist differences between the two consumer markets regarding the involvement of governments with Gabon (Chapters 1, 4, 5 and 7). The introductory chapter identified China's presence in Sub-Saharan Africa as one, among other things, driven by resource security. Access to resources is often achieved through a combination of trade, aid and FDI (also referred to as the Angola-model) under the coordination of China's EXIM Bank and often through Chinese state-owned enterprises. Private investors receive state and financial support, too. In case of tropical timber, the Chinese government is thought to actively encourage extractive activities in the South (including Gabon) and to provide diplomatic support to logging companies. Whilst the latter was confirmed by chain actors in Gabon during interviews, an Angola-model like intervention could not be observed and Chinese companies would not discuss the origin of financial capital with the author. Both Chinese private and state-owned enterprise participate in Gabon's tropical value chain. In contrast, it appears that European governments seek to influence chain activities by an active role in the formulation of legislative policy and by providing technical support on forest management issues, largely at the administrative level (Chapter 5).

### **9.1.3 INTEGRATION OF CHINESE PRODUCERS IN GABON'S FORESTRY INDUSTRY**

In many respects Chinese companies are similar to other firms, for example with regard to the mode of sourcing and import location of capital goods. Yet, in some respects there are distinct differences (Chapter 7). In general, unlike most European companies, Chinese firms are less likely to engage in

downstream processing of timber. In fact, there is a concentration of activities on extraction and the processing of sawnwood<sup>114</sup> (in compliance with national legislation<sup>115</sup>). Next, Chinese companies entered the industry at a later period than their European, Malaysian and Gabonese counterparts did. For this reason, Chinese investors are also referred to as ‘third wave’ foreign investors. Furthermore, Chinese companies have larger networks of production measured by the number of visible domestic subsidiaries and invisible satellite companies. Chinese satellite companies are believed to function as resource taps for visible Chinese companies, who further outsource their environmental harmful practices to them. It was found that none of the satellite companies are amongst the enterprises that started to operate according to sustainable management criteria (measured through global standards and types of concessions, Chapter 7). The share of Chinese workers is asserted to be higher at satellite companies than both visible Chinese companies and industry averages.

Overall, producers’ value chain participation can be explained by companies’ dominant trade partners rather than by the nationality of ownership alone. Put differently, activities in producer countries are predominantly determined by the requirements of foreign markets and not by the owners of production. The behaviour of satellite companies, though with more severe socio-environmental consequences, is determined by their domestic Chinese-owned parent company. These Chinese companies trade most intensively with the Chinese market, which requires large volumes of tropical logs (often sourced without reference to socio-environmental consequences). The same holds for most Gabonese producers, who export their raw materials to the Chinese market. Most European companies’ activities are a function of their dominant export market for wood products in Europe, thus explaining their participation in downstream processing activities and third-party certification schemes.

Besides the direct influence of markets on producer activities, companies’ abilities to overcome industry barriers strongly determine their activities. Especially Gabonese companies face difficulties to successfully participate in processing activities for the European markets, because of size, and linked to this the ability to achieve scale economies, as well as access to financial capital, skilled labour and

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<sup>114</sup> One Chinese company also produces veneer for the European market (Chapter 7). At this moment it is not possible to draw generalised conclusions; at the same time it should not be dismissed as an outlier, either, as it supports rather than negates the research finding of the dominance of ownership of markets over ownership of production.

<sup>115</sup> One interview partner reported that much of the sawnwood produced by China for the Chinese market is only cut roughly and at dimensions to fit shipping container sizes. The interviewee suggested that although the timber is officially recorded as sawnwood (and thus contributing towards domestic processing requirements) it is in fact still log-like as processing is kept to a minimum before exportation. Note that this information could not be triangulated and was hence not part of the analysis in Chapter 7.



technology (where the latter two variables are in turn a function of access to financial capital because these factors of production have to be imported). Moreover, it should be noted that the European market indirectly influences the activities of those companies that dominantly supply the Chinese market through Gabon's regulatory framework (influenced by the 'Northern' global forestry governance system), and through pressures exerted by established European and Gabonese companies, whose value chain participation has been determined by its long engagement with European markets.

The research finding that ownership of markets prevails over ownership of production is supported through statements by industry actors in Gabon, who describe the general performance of Chinese companies in Gabon today as similar to that of French companies some 50 years ago, a period when Europe was probably in the transition from an industrial phase of forest utilisation, where colonies were used as resource taps, towards a post-industrial phase of forest utilisation, particularly characterised by the imposition of sustainable forest silviculture methods (Chapter 4). From this perspective, the entrance of all investors namely 1<sup>st</sup>-wave European, 2<sup>nd</sup>-wave Malaysian and 3<sup>rd</sup>-wave Chinese are founded on the similar need to expand limited domestic resources by sourcing these from abroad. French market demands clearly shaped the activities of Gabon's forestry industry at a time of near absence of state interventions. Contrastingly, the dominance of the Chinese market crystallised more or less at the same time as state regulations were imposed. Chinese buyer standards conflict with the reform's main goals.

#### **9.1.4 DISTRIBUTION OF INCOME AND PRODUCT SPECIALISATION**

In Gabon, the forestry industry has traditionally focused its activities on the extraction and exportation of tropical logs. Research results have further shown that for producers in Gabon the participation in the log sub-chain is the most profitable activity as resource rents can be appropriate here but are substantially reduced throughout the processing of timber, especially in the log and veneer stages of production (Chapter 8). Thus, unless producers in Gabon are engaged with European markets and have the financial/labour/know-how capacities to integrate both the processing of veneer and plywood into their activities, the financially most attractive option for producers is the extraction/exportation of tropical timber to foreign markets, specifically China. The concept of economic rents supports the interpretation of research findings. In the case at hand the focal point is exclusively on Ricardian resource rents as Schumpeterian 'innovation' rents are not appropriated due to weak capabilities of a

large number of firms and (in particular) the poor economic and infrastructural environment in Gabon.

It is important to point out that the distribution of intra-chain surpluses is opposite to the increase in 'cost-addition'. On the one hand, cost is added to the tree when it is extracted and removed from the forest for consumption. Additionally, processing activities add costs as logs are converted into any type of wood product; higher degrees of processing result in a higher cost of the respective final/intermediary product. These domestically-determined costs are not reflected in prices, which are determined by global competition. Thus, profit margins of processors are negative or smaller than that of logging companies. It is hence essential to identify the nodes of production, to measure the real value-added (as determined by international prices) at each node, and to investigate whether the additional deployment of labour and capital actually results in an escalation of income.

A simulation exercise aided the exploration of the consequences of major shifts in global demand arising from the change in the nature of consumption of the major countries driving the world economy. To illustrate this issue, we simulated the impact of each form of production specialisation on employment, capital costs, foreign exchange and factors of production. The results show that domestic factors and Chinese consumption patterns of tropical forest products do not support processing activities. In more detail, an increase in employment numbers due to an intensification of value-adding activities comes at a considerable cost. Moreover, capital and labour productivity rates are highest at the extractive level, which additionally can generate high foreign exchange earnings and were shown to be the most profitable activity for producers.

In fact, processors in Gabon reported that the financing of processing activities are often covered by revenues made from the extraction and exportation of logs (Chapter 7). Furthermore, the restricted access to capital and the lack of skilled labour have limited industry actors' engagement in processing activities to European-owned companies, which receive factors of production from their European-based headquarters and which predominantly trade with the European market. The forestry industry operates in an economic environment shaped by the dominant oil industry and by a non-supportive political economy. As a result, logging companies in Gabon prefer to focus on extractive activities, because processing activities require the import of capital goods, the need for domestic transport (a major production cost item), and the identification and training of labour. In many cases, participation in

the sawnwood processing sub-chain is thus an outcome of domestic legislation rather than markets.

### **9.1.5 STRUCTURAL CHANGES IN GABON'S TROPICAL TIMBER VALUE CHAIN**

All four sub-chains (logs, sawnwood, veneer and plywood) that existed before the dominance of the Chinese market still exist today. However, the replacement of France by China as Gabon's dominant trade partner has a significant impact on the organisation of production in Gabon's forestry industry (Chapter 7 and 8). Whereas industry requirements in Europe largely initiated the creation of processing sub-chains, Chinese industry demand almost exclusively for raw materials led to an intensification of extractive activities, or engagement of logging companies in Gabon's log sub-chain (to a degree that resource shortages are reported by processors active in the processing sub-chains). There is thus a change in the international division of labour that re-enforces industry actors' focus on the extraction and exportation of raw materials.

These changes are inter alia documented through Gabon's export data, showing that compared to the large volumes of exported tropical logs to China, exports to France of processed wood products converted into their roundwood (log) equivalents are now higher than exported log quantities (Chapter 5). Moreover, primary data from Gabon in combination with existing disaggregated trade data demonstrated that the specific tropical log species that are traded today are of a far wider range than before (Chapter 5). This has increased the intensive margin of production, which was previously restricted to between four to five species, as well as the extensive margin as forest areas void of Okoumé have recently been taken into production, specifically by Chinese and Malaysian companies (through the acquisition of existing companies and the establishment of new companies, see below).

The changes in chain governance measured through the type of standards which markets set, and thus how market access is defined, resulted in the inclusion of a wider range of participants in Gabon's domestic value chain. First, producers find it generally easier to comply with Chinese-defined standards than those set by European markets, especially regarding the variables quality and environmental compliance (Chapter 6 and 7). Achieving these standards requires investments into capital and human resources, as well as those necessary to prepare, achieve and maintain a third-party legality and/or sustainability certificate. Still, access to finance is an industry entry barrier that in most cases favours large-scale, foreign-owned companies. Specifically Gabonese small-to-medium

sized companies and 'petits permis' concession holders can engage with the Chinese market but not the European one. Second, there is evidence that in the recent past (European-owned) companies went bankrupt, were sold or closed down because of their unprofitability (Chapter 7). Some of these companies have been bought by Chinese/Malaysian-owned companies in Gabon. These companies continue to operate in large part because production costs are lower in the absence of environmental (and labour) compliance costs imminent when the EU was still the dominant market.

In addition to the Chinese-induced changes in the organisation of production, national governance was identified as an important explanatory factor. The reform of the legislative framework in light of growing needs for economic diversification (hence challenging the predominance of the enclave oil industry), most visibly symbolised through the abolition of the export monopoly SNBG and the introduction of the Forestry Code, directly influences the domestic structure of production (Chapter 5). Domestic national governance (informed externally by creditors and particularly global governance actors in Europe) conflicts with the Chinese-driven chain governance as the latter leads to a focus on the exportation of logs, whereas the former aims to promote domestic processing industries. Industry actors are directly influenced by national regulations, though in most cases logging/producing companies consider the actual requirements to impair their operations rather than to be supportive. The ability of the Gabonese state to enforce, monitor and sanction industry behaviour is questioned by industry actors and experts.

#### **9.1.6 CONCLUDING REMARKS**

The research hypothesis states that, given the organisation of production and trade in global value chains coordinated by dominant chain actors, a redirection of trade away from traditional buyers in the North towards the emerging economy of China will lead to transformations in the governance and organisation of increasingly Sino-driven global value chains. Changes are likely to be disruptive to existing developmental axioms. Furthermore, the growing presence of Chinese producers in Southern resource industries has the potential to accentuate structural changes in the organisation of production, because Chinese actors' activities are said to be concentrated in the extractive rather than the processing stages of production, often in disregard of socio-environmental consequences.

The shift in final markets from industrialised countries that have outsourced non-core activities to the South and that are at a post-industrial stage of forest utilisation and domestic exploitation towards

China, which is at a resource-intensive stage of economic expansion in general and its domestic wood processing industries in particular, has changed the functional division of labour at a global scale. China's demand for logs reinforces extractive activities in Gabon, which are most easily achieved by all actors of the domestic value chain and are characterised by positive returns, in light of domestic distortions. In this sense, China fills a vacuum created by the change in consumption pattern of Europe, which increasingly imports processed wood products instead of tropical logs, which in particular Gabonese producers in Gabon find more difficult to adjust, too. Foreign companies are more likely to have the resources to exit the industry or to upgrade their functions according to EU market requirements.

As the dominant market of Gabon's forest products has shifted to China away from the countries in the European Union, Gabon's comparative advantage in the production of tropical timber has been reinforced. Whilst struggling to compete competitively with other tropical producing countries that additionally developed processing capacities/capabilities, the exclusivity of tropical wood species to Gabon, which are now demanded by China, has created space for a comparative advantage in extraction. Contrastingly, a lack of skilled labour, capital goods and infrastructure, as well as the macroeconomic environment and political economy of Gabon has largely impeded the growth of competitive processing industries in Gabon, and the 'creation' of comparative advantage in labour-intensive processing.

The presence of Chinese actors in Gabon's industry follows a normal pattern as their activities are driven by final market requirements. However, the prevalence of so-called Chinese satellite companies whose activities are large unregulated and not monitored, plus the information about an expansion of the intensive and extensive margin of production (specifically among Chinese companies but also across other groups of producers) disrupts the sustainable resource exploitation imposed by EU buyers. This aspect may hence accentuate not only the functional division of labour, but also the rate of production in the future, as forest stocks are removed for profits today (beyond the traditional sustainable margin applied under the silviculture system *Méthode Okoumé*) but might also be destroyed (to an unknown degree) for production purposes in the future.

## **9.2 DISCUSSION OF RESEARCH RESULTS AND THEORY**

The second chapter of this thesis reviewed two sets of relevant theory as informing and being informed by the research of this thesis. The first is the discussion on the role of natural resource sectors in development. The second is the nature and determinants of global value chains. Running through both discussions was the disruptive impact of China's rapid growth on the global economy. Our research focused on the tropical forestry industry, in particular the domestic tropical timber value chain in Gabon, to assess whether similar and/or additional disruptions exist. Throughout the subsequent sections research results from this thesis are reflected upon in light of both groups of literature and the prevailing model of economic development.

There exists a general agreement that economic development is a rise in income additionally characterised by a change in the structure of an economy. The road to growth via industrialisation is believed to be path dependent, moving from agriculture towards manufacturing industries and eventually to the services sectors as the main source of income. Factors of production are thus shifted from relatively low-productivity sectors into those where higher productivities are achieved. These are predominantly in manufacturing, and in many low-income countries in labour-intensive manufacturing. The two growth-enhancing factors of production are human and made capital, complemented by technological change. The axiom of economic developments is thus industrialisation, achieved by factor accumulation in (outward-orientated) manufacturing industries and trade participation.

### **9.2.1 ROLE OF NATURAL RESOURCES IN ECONOMIC DEVELOPMENT**

According to the staple theory the demand for primary materials by the industrialising North (here specifically Western Europe and the USA) would subsequently lead to economic growth in the South (Innis, 1940; North, 1955, Watkins, 1963). More specifically, it was believed that low-income countries with a limited domestic market, unexploited natural resources and a high man to land ratio would profit from the strong demand for primaries. Driven by this demand, the intensity of factor utilisation would increase as previously unproductive resources (land and labour) were taken into production. Furthermore, it was asserted that an expansion of resource exploiting activities would eventually result in the development of vertical (downstream) and horizontal linkages, and hence a diversification of activities around the resource base. Overall, growth in low-income resource-rich economies in this framework is driven by demand from high-income Northern economies.

The observations of falling resource requirements in the 'dematerialising' North, as well as the absence of domestic linkages and technical progress in most developing countries (also termed a 'staple' trap of specialisation in raw material extraction), led to the formulation of the thesis of falling terms of trade. Most notably the work by Prebisch (1950, 1959) and Singer (1950) showed that the assumed comparative advantage of the South in producing natural resources for consumption in the North was unjustified given real price trends and perceived low barriers to entry in resource production. The authors showed that resource exporting countries experienced a relative fall in export prices of their resources compared to increasing prices of manufactured goods they imported. It was concluded that the prevailing international division of labour was discriminatory towards developing countries and that instead low-income countries should participate in manufacturing-focused industrialisation.

Industrialisation through an expansion of capital was considered the best option for achieving economic growth (Harrod-Domar growth model). Capital accumulation was partly to be financed through the foreign exchange earned by a continuation of exporting commodities. Further research stressed the importance of human capital as a complementary prerequisite to growth, with "acquisitions of useful knowledge as analogous to inanimate capital formation" (Killick, 1980, p. 378; Mankiw et al. 1995; Romer 1986). The universal acceptance of these two variables (human and physical capital) is highlighted by Adelman (1999, p. 18) stating that "... all LDCs (less-developed countries) stressed accumulation [of human and physical capital] as a sine qua non for development ...", though different accumulation patterns resulted in "achievement of comparative advantage in either labor or capital intensive exports".

An increasing number of developing countries embarked on the process of industrialisation through factor accumulation in labour-intensive manufacturing (Collier, 2002; Dollar, 2001). Yet, mounting econometric results showed that there are resource-rich countries that failed to do so successfully. These countries continue to depend on commodities as the main earner of foreign exchange and the largest domestic sector (UNCTAD, 2003; Wood, 2001). It was asserted that natural resources are detrimental to economic growth. The resource curse literature addresses reasons such as Dutch disease, price volatility, terms of trade, and variables of political economy (Auty, 2001; Sachs & Warner, 2001). Despite the persistent appearance of the resource curse in the literature, the underlying notion that resources are 'cursed' is being challenged by further research (Lederman & Maloney, 2008;

Rosser, 2006). Studies demonstrated that while there is no absolute comparative advantage in the existence and access to resources, these can support industrialisation processes as natural resources can be vital inputs (next to human and made capital) into manufacturing processes and thus upstream linkages (de Ferranti et al., 2002; Reinhardt, 2000).

The rise of China, an emerging Southern economy at a resource-intensive industrial stage of economic growth has a significant impact due to the size of its population and its weight in the global economy on both prices of manufactured goods and commodities, e.g. by inducing an unprecedented commodity boom during 2003-08 (and probably again in the near future) (Farooki, 2010; IMF, 2006). The combined effect appears to be resulting in the reversal of the terms of trade of resource-exporting developing countries at least since 2002 and over the medium term (IMF, 2008; Kaplinsky, 2006a, b). Additionally, commodity trade flows are redirected away from the OECD, as the traditionally consumer of natural resources, towards Chinese industries (Goldstein et al., 2004). Furthermore, its impact on factor prices challenges the international division of labour and other countries comparative advantage (historically defined by and aligned to the North). Lastly, existing studies observed a transfer of factors of production from manufacturing industries into resource (extracting) sectors (e.g. Holz, 2008; Wood & Mayer, 2009).

Research results from this thesis complement these findings. We showed that China has a disruptive impact on the international division of labour in the tropical forestry industry and international trade flows of logs. China has hence replaced the North as the driver of imports of primaries with importance to countries, like Gabon, that still export much of its commodities as raw materials. Indeed, for Gabon China's resource needs for unprocessed wood led to a surge in production of tropical timber at a rate higher than at any previous time. China replaced France as the dominant export location of Gabon, and thereby reintroduced a comparative advantage in the former and caused factors of production to be transferred into extractive industries.

Global tropical log prices never experienced long periods of falling prices as is true for many other commodities (not protected by barriers to entry). The general rising trend of tropical log prices is because of access barriers (physically, geographically and created through concessionary systems), falling global production volumes (due to deforestation, forest management systems and so forth) and



a general rise in consumption. China's demand for tropical logs has led to an increase in the price of tropical timber species, which it consumes intensively. As a result, Gabon's 'tropical timber' terms of trade (constructed in Chapter 5) further improved in the past years. In sum, while one part of the equation (price deterioration), which negated the argument of a comparative advantage in natural resource exploitation and exportation, applied weakly to tropical timber, it is now accentuated as demand for natural resources continue to increase in China.

The most fundamental assumption of residing resource needs has been reversed by the emergence of China. More specifically, the staple thesis, the vent-for-surplus theory and the frontier thesis based their analysis on the assumption of rising resource needs in the North. When this assumption became obsolete as the resource-intensity of growth in the North subsided, the above-mentioned theories were largely dismissed as popular economic growth models. The Prebisch-Singer thesis, based on the observation of falling resource requirements from the North, concluded that relative natural resource prices deteriorate over time. The resource curse literature uses the fall of resource-exporting countries' terms of trade as an argument against a detrimental position of natural resources in achieving economic growth. The conventional wisdom arising from these literatures is the need to industrialise (with an increasing recognition of the role of nature resources to the industrialisation process).

On the basis of research findings of this thesis, the role of natural resources in economic growth should be revisited, not in absolute terms that would dismiss the concept of industrialisation, but in a relative sense that considers natural resources' key role in industrialisation processes. The impact of China challenges low-income countries' participation in global production and trade (and the means to do so given the sharp rise in commodity prices and the reversal of terms of trade). Their comparative advantage is now defined by Chinese industries. The role of natural resources in economic development is challenged by China's hunger for raw materials. Is this therefore the time to revisit natural resource-based economic growth concepts such as the staples theory?

### **9.2.2 THE GLOBAL VALUE CHAIN FRAMEWORK**

The decision to use the global value chain framework as a guiding method for this study has proven to be productive. Still, research results based on a specific method naturally provide feedback to this body of literature. In particular, existing global value chain literature, whilst recognising the significance

of different types of buyers (including a differentiation of buyers in Northern economies), does not consider the importance of economy-type markets. In this study, discrepancies between the markets in China and in the North qua standards and consequently barriers to market access are a consequence of two factors, namely the structure of domestic processing industries and countries' phase of forest utilisation. Given the approach in comparing markets that are at different stages of economic development, a 'conventional' study of a global value chain that ignores these differences in final markets, would have missed essential explanatory factors, i.e. forest products importing countries' consumption patterns and barriers to entry to these markets, which impact on the division of labour as well as chain governance.

Linked to the above, the role of the global governance and national governance systems were demonstrated to play a crucial role in defining industry actors' activities. In particular, external governance affects some of the standards lead firms define to suppliers. Additionally, the agenda of international organisations like the International Monetary Fund (IMF), the World Bank and the European Commission (directly and indirectly) impact on the organisation and functioning of domestic industries, as well as the environment in which these industries operate. We believe that whilst the importance of actors (at all levels) external to global and/or domestic value chains is often recognised (e.g. Frederik & Gereffi, 2009, p. 1, write that "a firm (or organisation or institution) can set parameters under which other in the chain operate"), the bulk of value chain analysis focuses on intra-chain governance. This thesis shows the benefits of expanding the area of research by also considering other forms of governance (and an identification of the institutions as well as regulations they define).

Besides a differentiation of final markets at different stages of economic development, this thesis compared value chain actors in Gabon with each other, and linked observed differences to final markets. We believe that a careful distinction between companies qua ownership but also with respect to company affiliations is an original contribution to existing GVC literature and those that focus on Chinese companies in extractive sectors in Africa. In more detail, Imperato & Corkin (2010; also used in Kaplinsky & Morris, 2009) propose a typology of Chinese central- and provincial SOEs, private enterprises and individual entrepreneurs. They argue that companies in each group vary according to their outlook, competitiveness, technical training and local skill enhancement, as well as labour policies, which results in significant differences in the overall business performance, management

styles and engagement with their host countries. In this thesis, satellite companies were shown to be a significant group of producers that should be included in this typology.

With respect to the research results on the intra-chain income distribution, we concluded that it is essential to identify the nodes of production, to measure the value-added at each node, and to investigate whether the additional deployment of labour and capital actually results in an escalation of income. In our opinion, the importance of such an approach has been demonstrated in this thesis, specifically in further explaining industry actors' sub-chain participation, and should accordingly be used more frequently in other global value chain studies. This is because the assumption of increasing value-added and implicitly higher producer margins at downstream activities is not necessarily valid but critically depends on the consideration of production costs (as done when using input-output tables), as well as the concept of rent, which requires an analysis of given and/or created barriers to entry.

Furthermore, the assumed positive relationship between value-addition and producer surpluses in some studies using the GVC framework has shaped the concept of 'upgrading' in the GVC literature, generally associated with producers' ability to perform activities further downstream in the value chain or to move into new chains. This thesis shows that upgrading understood as moving into new downstream processing links in the chain, may be at the cost, at least in the short-to-medium term, of income and employment. This is because the information presented here supports the current Chinese-induced concentration on resource extracting activities, which is at the upstream end of the value chain, and thus contrary to the often generalised understanding that industrial upgrading implies a move downstream the value chain.

The concept of upgrading is a dynamic concept as skills and capabilities of actors in a global value chain can change or evolve over time. In the case of many producers in the South, their dynamic capabilities are a result of evolving buyer requirements in the North to which the producers are linked. With respect to this thesis, it should be noted that standards are thus dynamic in nature, too. This holds true for the evolution of European standards, initially focused on consumer health and safety but increasingly incorporating consumer interests in the provenance and sustainability of consumer goods, including tropical timber forest products. It was pointed out that these changes in Europe are a result of socio-economic changes of society and a transformed view of the function of forests.

It is thus reasonable to highlight that standards discussed in this thesis (e.g. Chapter 6) are snap-shots reflecting the status quo at a particular point in time, particularly one where Europe is in a post-industrial phase of forest usage whilst China is in the industrial phase. As Chinese processing industries develop and as incomes in China (and other socio-economic factors) are likely to change over time, so can standards that are currently set by Chinese buyers progress. Furthermore, given that forest products produced in China (from Gabonese logs) are exported to Europe, pressure already exerted by European environmental organisations, buyers and consumers on Chinese processors is likely to eventually impact on processors in China. Consequently, one can expect that standards such as third-party certification are demanded by Chinese processors from their log suppliers in Gabon. In sum, especially private standards have evolved over time due to changes in society and the demands they make of forest products. This dynamic nature of standards, although not part of this thesis given its focus and research area, is quintessential to the GVC framework (see also Section 9.4)

### **9.2.3 CONCLUDING REMARKS**

The research results of this thesis were derived from a study focusing on tropical timber as a commodity, and the tropical forestry industry in Gabon as the case study location. It is thus reasonable to consider the degree to which these research results hold in general, and which are a factor of the choice of case study. There are a number of striking features about the tropical forestry industry that may set it apart from other commodity sectors: traditionally increasing log export prices, state ownership of resources (thus leading to concessionary systems of access), the existence and appropriation of Ricardian-like resource rents, and the fact that timber is extracted from (natural) ecosystems delivering a range of products and services, as well as which is home to significantly large numbers of people, animals and vegetation.

The predominant extraction of tropical timber from natural and second-growth forests will always differentiate this industry from other agricultural sectors, where the dominant share of production originates from plantations, which are monocultures and which are more mobile. With respect to the latter, the tropical forestry industry seems more similar to other fixed point mineral sectors than to geographically mobile agricultural commodities. Notwithstanding, tropical timber is a renewable resource similar to other agricultural raw materials but not to minerals that are finite in supply. Yet, as long as industrial roundwood is extracted from forest ecosystems rather than planted forests, some of

the peculiarities mentioned above remain valid, i.e. the need for multiple-application considerations of wood and non-wood forest products and forests as habitats for humans, plants and animals.

The distinctive feature of tropical timber in Gabon is the combination of national regulatory systems and state-ownership of forests that results in barriers to resource access (and thus the possibility of resource rent appropriation). In some respects, this holds true for some other agricultural products where land ownership (or in case of fisheries production quotas and licensing schemes) and climatic conditions restrict access to resources that are unique to the South. It applies even more so for point resources, with their existence being limited to certain geographic areas and where access is controlled through concessions. Naturally the validity of research results in general is further restricted to commodities which are demanded in significant volumes by China (and India, another emerging economy whose population size is expected to excel that of China in the future).

The continuous increase in log export prices is not unique but can also be observed for other commodities. The increase in log export prices due to China has occurred across all groups of commodities, hence causing the usage of the term commodity boom, which among other things is restricted to those periods when all groups of commodities experience price improvements. Price increases thus occur also for other agricultural raw materials and metals. The terms of trade are a result of prices of commodities (exported by the South) and manufacturers (imported from the North but now increasingly also from other developing countries, in particular China). The terms of trade are dependent on countries' export and import structures, but are generally believed to have improved for a large number of resource-exporting countries.

Many of these resource-exporting countries are also classified as commodity-dependent countries, i.e. a predominant share of foreign exchange is earned by exporting (often) unprocessed raw materials. Gabon is a representative of this group of countries. To some degree, research results obtained in this thesis, especially regarding the role of natural resources in economic development in an environment increasingly shaped by the Chinese (or emerging) economy, thus also apply to other low-income commodity-dependending countries.

### 9.3 IMPLICATIONS OF RESEARCH RESULTS FOR POLICY FORMULATION

In a perfect world policy formulation in light of a commodity boom would be straightforward. Industry profits from a rise in demand of its product, which is now defined by China's requirements of tropical timber, while government increases its revenue based on the volume of resource rents. In other words, concession fees can theoretically be charged up to the point where marginal costs equal the marginal benefit of those extracting the resource, or up to the point where firms still earn a normal profit rate (Khan, 2000). Simultaneously, the state is advised to prepare and act against possible Dutch Disease effects. Ideally, revenues received from the resource sector are distributed to society and/or invested in resource-based industrialisation. In a study that asked the question about natural resources and development strategy, the World Bank concluded that "booming commodity revenues raise difficult challenges that, if not adequately addressed, can harm long-run development. However, with good policies, governance, and management, such revenues can also be a valuable resource that helps accelerate overall economic and social development" (Brahmbatt & Canuto, 2010, p. 7).

The world is not perfect. Theory often does not translate into reality, especially in an environment of political and legal difficulties. The performance of the government of Gabon has to be judged as poor. Gabon is in many studies used as a typical oil-rentier state that suffered from Dutch Disease (Söderling, 2002, 2006; Zafar, 2004), which is characterised by corruption and sub-optimal judicial systems, which runs inefficient state monopolies, where political decision-making is often based on rent-seeking, and where political posts are inherited rather than won in elections (Chapter 5). According to actors of the forestry industry, among others, the allocation of concessions to some degree still depends upon personal networks. Transport companies reported that they have budgets specifically to finance necessary bribes at unofficial police road blocks<sup>116</sup>, and the overall staff (and equipment) of the Ministry of Forestry (MEFEPA) is considered insufficient to monitor logging companies' activities.

Recent changes in government policy, specifically the introduction of the Forestry Code, is a result of efforts of economic diversification in light of long-term decreasing oil productions (and hence a definite loss of oil revenues). In contrast to the enclave oil industry, the tropical forestry industry is the second largest employer after the state, which is one reason why this industry has recently received much more state attention than in the past. Legislative changes specifically aim to enforce industrial

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<sup>116</sup> One interviewee estimated these to be around FCFA 80,000 (€122) per truck and month.

upgrading through the processing of tropical timber into processed wood products. This decision is founded on the belief that more employment possibilities are created and that products of higher value(-added) are exported. In light of research findings of this thesis, one might add that the legislative changes are based on the assumption of a dominant OECD market, and thus demand for processed wood products and a limited range of tree species.

The Forestry Code specifically states that of all forest products' exports 75% should be comprised of processed wood products and only 25% of logs. During the write-up of this thesis in November 2009, the government of Gabon announced a log export ban as of 1<sup>st</sup> January 2010 to stimulate domestic processing activities. An initial interim period until the end of April 2010 was given during which remaining stocks of logs could still be exported. This date was changed to 15<sup>th</sup> May 2010 (EUWID, 2010; ITTO, 2009b, 2010). According to latest news "the volume of logs already cut in the forest, in the industry log yards and those logs currently being transported by rail and road is in the order of 500,000 to 600,000 cubic metres" (Chatham House, 2010).

The government of Gabon announced on its website ([www.legabon.com](http://www.legabon.com)) that, "this measure [i.e. the log export ban] is aimed at encouraging the local transformation of wood, which would make it possible to create high value added on the products originating from this sector, large numbers of qualified jobs and would showcase the skills of Gabonese forestry operators and industrialists in the valorisation of raw materials by an innovative, leading edge industry". Furthermore, it is reported that "Gabon hopes to fill job loss due to the ban with expansion in its processed wood market, and eventually move its market toward finished wood products".

However, as an immediate consequence of government-induced supply constraints in Gabon, Cameroon has increased its production and exportation of logs (to China) (Hance, 2010). Regarding employment creation, these were shown to critically depend on the injection of capital into the establishment of processing mills and infrastructure (Chapter 8). Gabon notoriously lacks qualified labourers (Chapter 5). In the forestry industry, skilled labour is frequently imported from abroad given the absence of a domestic workforce able to fill vacant positions in the industry (Chapter 7). Moreover, the capacities and capabilities of domestic processing industries are insufficient to achieve competitive rates of processing in accordance with national legislation.

To illustrate the last point, during one interview the author complimented the interview partner for the beautiful wooden chairs in the waiting area. The company representative smiled politely and said that he bought them at Ikea in Germany. On another instance the reply to the question of secondary processing capacities in Gabon, like doors, was one of disbelief as “this is unprofitable; Gabon cannot compete with these products. It’s much better for us to produce them in France”. During a discussion with a Malaysian producer the author asked whether processing activities are likely to be further expanded. The reply was that the Malaysian owner would be unreasonable to shift his existing processing facilities from Malaysia to Gabon where “everything is much more expensive and more complicated”.

Moreover, though not extensively discussed in this thesis, China’s expanding processing capacities seem to impact on the competitiveness of other wood processing industries, e.g. those in the North with relatively high labour (and environmental compliance) costs (Chapter 4). Competing with Chinese processing industries may be very difficult due to intense competitive pressures, and specifically when production costs are higher than those in China, which is currently the case in Gabon. At the moment, industry actor reported that they are not in direct competition with Chinese producers as Gabonese products are of higher quality than those processed in China. The sustainability of this competitive strategy might be questioned based on statements about the innovative potential of Chinese industries (Chapter 4).

Policy formulation based on the traditional convention that OECD markets are the dominant consumer of tropical processed wood products, and on the assumption that resource rents can be transformed into Schumpeterian rents no longer seems to be appropriate. This thesis showed that China is now the driving force in the tropical forestry industry with respect to its raw material needs, its large markets of consumers of wood products and its leading position as a processor of wood products. At the moment, an export log ban seems to be a counterproductive move as Gabon’s domestic processing industries neither have the capacity nor the necessary human and made capital to absorb domestic resource supplies.

It is our opinion that Gabon’s comparative advantage lies in the extraction and export of tropical timber. In fact, profits could be further improved given the provision of adequate physical infrastructure, skilled



human resources and complementary domestic industries. However, sustainable resource usage in the past was not a result of national regulations, their enforcement and monitoring but a function of French processing demands with a preference for a few selected species and the subsequent adoption of the silviculture system *Méthode Okoumé*. The increase of the intensive and extensive margin of production due to China makes it important to regulate the access to and sustainable usage of natural resources. For example, the creation of new concession areas (mostly assigned to Chinese and Malaysian producers) in the Northeast of Gabon is in conflict with existing boundaries of a national park (the Minkebe forest). Consequently, logging activities threaten this hitherto undisturbed forest ecosystems and logging infrastructure facilitates the influx of poachers (de Wachter, pers. comm., November 2008). For this reason, the instalment of monitoring capacities is a prerequisite for the preservation of future forestry industry activities.

Furthermore, the investment in the proper management of forest stock is likely to prepare Gabon to exploit its natural resources also through alternatives routes. To give an example, the United Nations REDD programme<sup>117</sup> is specifically targeted at developing countries' whose forest stocks serve as carbon sinks for greenhouse gas emissions of the North. The programme thus assigns a monetary value to existing forests. Moreover, forest ecosystems in Gabon are insufficiently used for touristic purposes, which could be another source of revenues. Yet, the transfers of revenues from logging companies to rural communities that live in the concessionary areas are not sufficiently regulated in Gabon. Whereas the Forestry Code encourages logging companies to engage with local communities, the definition of the type of engagement and the implementation of activities is at the discretion of logging companies.

In short, we believe that current windfall gains should first be invested into the extractive level of Gabon's forestry industry. Physical infrastructure, education and enforcement of regulations regarding resource sustainability are basic public goods that the government can provide in support of the forestry industry. At the same time, it may create the foundation for an expansion of industry activities into profitable processing activities at a future point in time. This is because China will eventually exit its current resource-intensive stage of growth (or because of the regulatory impact of price on demand). In other words, investments into sustainable extractive industries will profit future expansions

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<sup>117</sup> Reducing Emissions from Deforestation and Degradation, see <http://www.un-redd.org>

of processing industries, which make use of the same inputs as the logging sector, but which is currently at a stage where it could not absorb such provisions.

Nevertheless, it was already remarked that the world is not perfect and maybe a little less so in Gabon. Given the current political climate a full absorption of resource rents by the state (who often failed to allocate resource rents to the general public) is not desirable, given the more direct deployment of investments by private industries. It could thus be argued that with regard to employment creation it might be beneficial to continue to enforce the expansion of processing industries, i.e. to come to a trade-off of inefficient processing but higher employment rates. This would also mean that current resource rents which are often absorbed by large foreign companies (and thus exported abroad) and/or by individuals in light of rent-seeking behaviour, would be transferred into the domestic economy through inefficient processing, because resource rents are converted into domestic production costs including employment.

However, it is not known what the reaction of industry actors will be if domestic processing requirements are enforced. In the past, some European- and Gabonese owned companies were taken out of production as production costs made a continuation unprofitable (subsequently bought by Chinese companies that do not face environmental compliance costs, that are less strictly monitored by the public and that may receive state support, e.g. in the form of cheap capital, and/or a protection from domestic monitoring by the Gabonese state). Given the unprofitability of processing activities, which can no longer be absorbed by exporting logs, it might induce industry actors to exit the industry, in particular those that are currently focused on serving the Chinese market.

The preceding discussion has shown that there are convincing arguments to expand extractive activities based on the existence of comparative advantages founded on China's resource-intensive economic growth period. Still, logging companies' activities need to be strictly monitored to ensure the sustainable extraction of one of Gabon's precious resources (which could further generate alternative revenue streams arising from the preservation of forests). There are equally compelling reasons to continue the enforcement of processing activities, specifically with respect to domestic employment creation. Yet, the impact on industry actors' sub-chain and industry participation is unknown, and skilled labour is a restricted factor of production in Gabon. It is not possible to weight each argument

with an accuracy to derive at a decisive statement regarding industrial policy formulation, and particularly with the emergence of China as a dominant resource consumer, capital investor, and industry participant that challenges many existing frameworks of analysis.

#### **9.4 FURTHER RESEARCH**

The scope of our research was defined by the time period and resources available to a PhD programme. Several topics were hence sometimes only introduced but not further investigated in those cases where it was considered of secondary importance to the main research focus. In other cases, the need for further research only emerged from our current research, and thus could not be included in any great detail into this thesis' analysis. The following paragraphs point out topics for further research, other than those mentioned in the previous sub-section such as the potential for tourism and a participation in the REDD programme.

First, data collected in Gabon were restricted to logging and processing companies, as well as the major external chain actors. No direct interviews could be scheduled with individuals, as explained in Chapter 3, who currently are in the possession of a concession, and thus who have access to Gabon's forest stock. These so-called *petits permis* holders, introduced briefly in Box 7-1 and mentioned en-route in various chapters, have played a vital role in the supply of tropical timber in the past and according to anecdotal evidence still to some degree today. For this reason their role in the system of production and their engagement with other industry actors should be studied in more detail.

Secondly, the analysis was restricted to the domestic forestry industry in Gabon, while information about its dominant trade partners was extracted from secondary data and from interviews with producers in Gabon. The analysis of the value chain can thus be extended to a global level through a similar mapping process as was applied in the case of Gabon. Additionally, interviews with producers/processors at nodes of production outside of Gabon, e.g. in France and China, would allow to repeat the measurement of standards. This is interesting because it would provide the opportunity for foreign buyers to assess producers' skills in Gabon and it could produce mirror-assessments (i.e. which standards do buyers set, how do they perceive suppliers performance and vice versa) for each node of the value chain. Such research would hence result in an inter-firm chain governance analysis, as well as would detect possible variations of inter-firm governance throughout the global value chain.

To give an example, when China exports processed wood products to Europe would one expect similar EU access barriers to prevail for Chinese suppliers than for suppliers in Gabon? Such an analysis would also disaggregate the discussion to a firm-level in France and China, which were treated as uniform in this thesis as both are discussed on a country-level only.

The dynamic nature of specifically global standards, which in case of tropical timber often require a chain-of-custody certification, is a topic not discussed in this thesis. More specifically, should certification standards increase in importance and are enforced by buyers, these standards are not only set to logging companies in Gabon, but also to processors in China, who could then be expected to enforce these standards on upstream tropical log suppliers. Yet, currently the enforcement mostly depends on European buyers as no legally binding global agreement exists. Instead, the FLEGT programme by the European Commission tries to create a network of bilateral agreements, which 'fails' should Gabon sign the voluntary agreement but not China. Given the information gained in this thesis, this would probably lead to an intensification of tropical log flows from Gabon to China with lower market access barriers (and from which processed wood products might then enter Europe).

Next, the comparison of different markets and the differentiation between chain coordination and chain governance (whereby chain membership is limited by prevailing coordination mechanisms such as standards) were to a large degree based on research by Ponte and Gibbon (2005). In a later paper, Gibbon (2008) further added to his research that cultural differences between importing countries play a decisive role in explaining the engagement of Mauritian clothing manufacturers with their global buyers. Differences between European and Chinese buyers of Gabon's tropical timber were also recorded during fieldwork for this thesis. For example, Chinese companies often hire senior French staff to facilitate the dialogue with Gabonese institutions, other industry actors and the state, as well as non-Asian buyers (Chapter 7). This subject was not further explored in this thesis but could be explored in further research.

Lastly, in the preceding section discussing this thesis' contribution to policy formulation it was concluded that in order for resource-rich countries to enter a phase of economic development, the creation of domestic linkages to complementing industries is of importance. In the case of Gabon, it was stated that linkages to domestic manufacturing industries (not necessarily service sectors) are rare

or even absent. The analysis did not discuss existing linkages in great detail except for three types of capital goods and financial institutions (Chapter 5 and 7). Yet, linkages may also extend far wider, for instance, to the educational sector. It is considered beneficial to study existing linkages in more detail, and to find explanatory reasons for the observed absence, or potential stimuli for their creation. The analysis should include existing linkages to the service industries.

## **9.5 STILL THINKING ABOUT ACEH**

The discussions and considerations that emerged with respect to the impact of our research results on industrial policy formulation also affect technical assistance programmes focused on commodities in low-income countries. Drawing on personal experiences from my work in the aquaculture sector in Aceh, some points immediately come to mind. First, the casual usage of the term global value chain by many consultants and project staff was and remains until today a frustration to me. Nothing about my work was in any sense global and the value chain framework requires an analysis beyond a geographic identification of activities (which in itself was carried out insufficiently). As discussed in the theoretical part of this thesis (Chapter 2) and supported by research findings, the spatial and organisational mapping of the division of labour is a descriptive analysis that needs to be complemented by a causal analysis of governance, which thus can provide an explanation for the observed pattern of production.

Next, the prevailing chain governance for particular nodes of production equally determines the intra-chain distribution of income. Incidentally, work in agricultural commodity sectors increasingly consider the introduction of producers to the Fair Trade scheme, with the aim to create barriers to entry so that resource rents can be appropriated by local farmers rather than by lead firms in the North (with additional means to create possibilities of Schumpeterian-like rents). The same 'strategy' was applied in the cocoa project in Aceh. Here, the participation in Fair Trade, with a long list of technical requirements that need to be met, was facilitated by the fact that local cocoa farmers had only limited access to their plantations and no pesticides were used for a considerable amount of time. Tragically, the latter was a direct result of the violent conflict as plantation and forest areas were turned into battle zones between the Free Aceh Movement (Gerakan Aceh Merdeka, GAM) and the Indonesian military. In another twist of fate, it is speculated that the tsunami in December 2004 and the resulting need for humanitarian and technical reconstruction work strongly induced the GAM (with low funds at that point

in time) to come to a peace agreement with the Indonesian government (which thus allowed foreign staff of development assistance agencies to enter the region and not only the provincial capital Banda Aceh).

Thirdly, while consultants in the aquaculture sector never mentioned the Fair Trade scheme as a possible route to follow, I still consider their initial advice to be ignorant of not only prevailing global value chain analysis but also significant changes in global systems of production due to the impact of China. With respect to the former, a simple fact that often seems to have slipped consultants' minds was that the current income of local aquaculture farmers was in fact zero. Raising this income would not have required substantial investments into post-production activities (ensuring compliance with e.g. phytosanitary EU regulations) but in the reconstruction of the means of production. This basically means a long and painful process of digging out fishponds destroyed by the tsunami. This is a far less 'glamorous' activity to be described in glossy project booklets for funding agencies in the North than the opening of a high-tech facility to sort and freeze shrimps for further transportation.

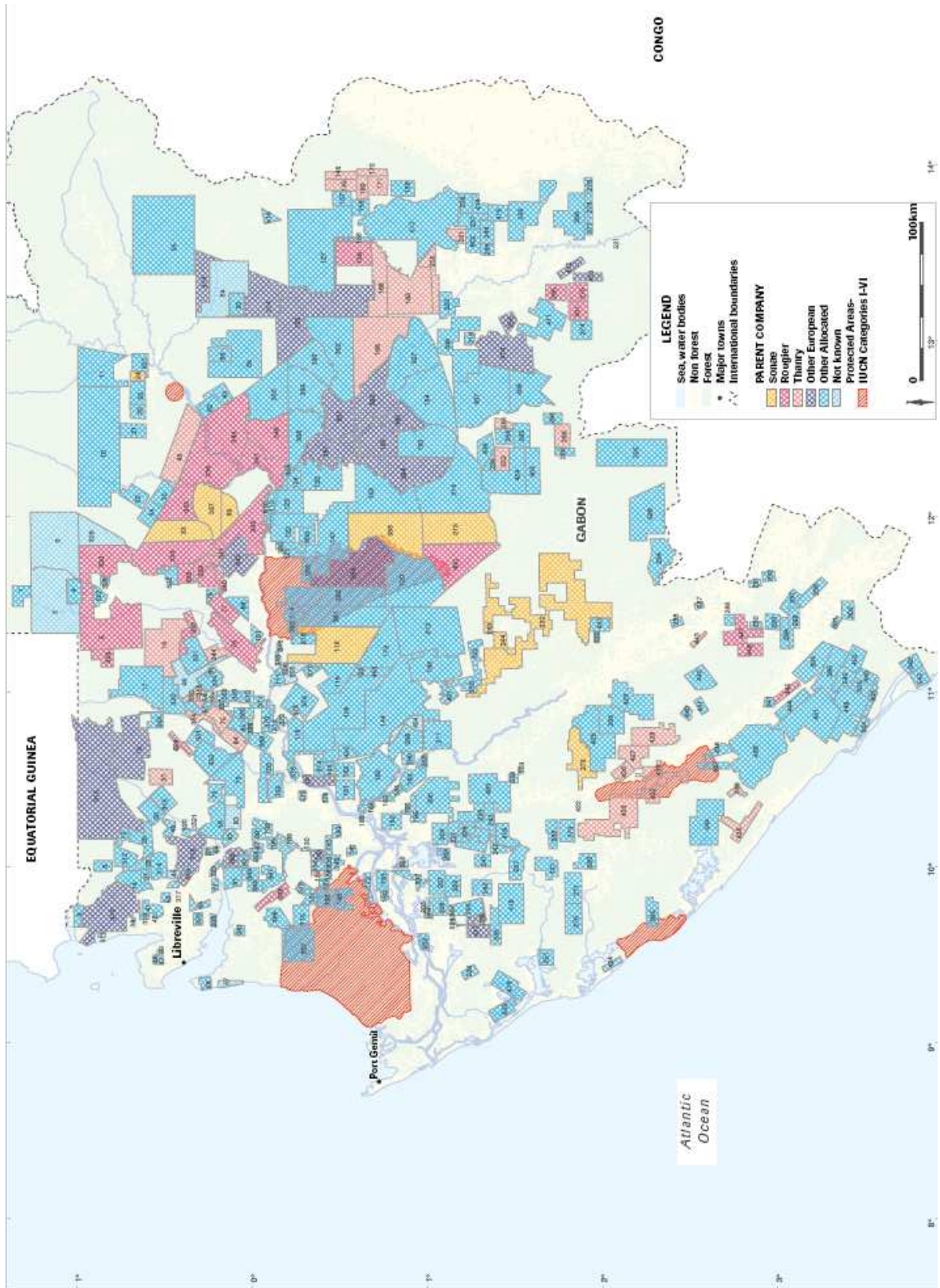
With respect to the latter, consultants who initially advised the aquaculture project formulated their strategies habitually with European markets as the dominant consumer of shrimps in mind. Introducing Acehese shrimps to the European market would require considerable capital investments in the production, transportation and standard-conformity activities, which is beyond the financial and skill capacities of farmers in Aceh. Yet, China (or in fact the growing Indonesian middle-income class) was never considered as a potential consumer of shrimps. Access to China is arguably 'easier' given lower entry requirements (and the fact that the Chinese/Indonesian market itself is expanding due to rising per capita incomes). It seems that now is the time that technical assistance programmes deviate from their established work routines, or in fact from the traditional assumption that commodities produced in the South are by definition consumed in the North.

Based on our research results, an analysis of existing trade partners and a differentiation of final markets are indispensable activities. This in turn influences the need for 'skill creation' in order for local value chain actors to be able to meet foreign market standards defined by buyers in either/both the OECD and China (or other emerging economies). For example, tropical timber produced for the Chinese market requires an emphasis on volume whilst those produced for the European market

require quality and sustainable production methods. But how will this impact the environment – in one case the forest ecosystem and in the other one the micro-climate of extensive networks of waterways and fishponds? Furthermore, is it fact that industrial upgrading, or adding 'value', necessarily results in an increase in the profit margin of upstream producers in low-income countries? The impact of emerging economies, specifically China, challenges conventional frameworks of analysis and modes of delivering development assistance.

# APPENDIX

**Map A-1** Concession areas in Gabon, differentiated by company (2000)

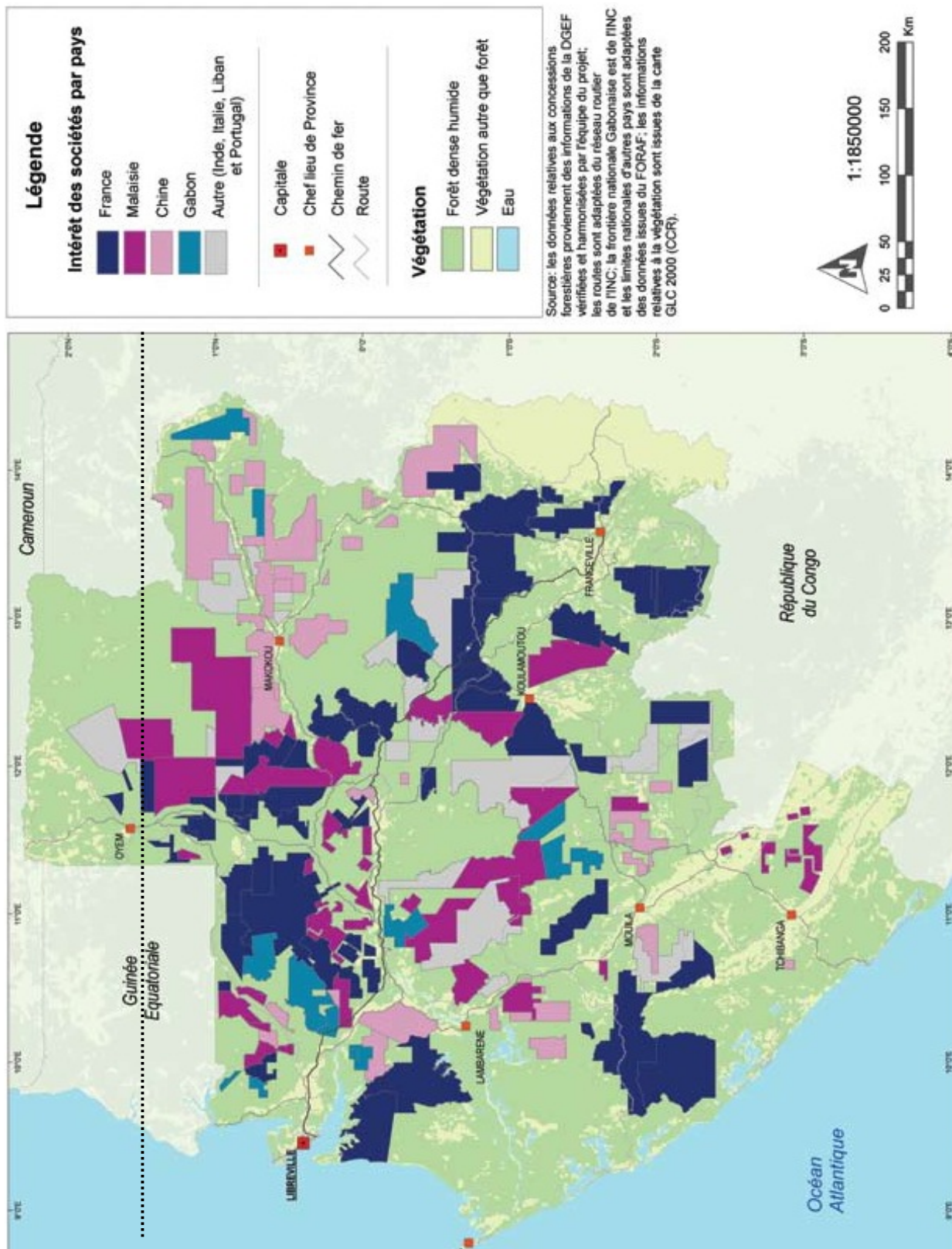


Source: Forests Monitor (2001, p. 39)

Notes: Map turned 90° counter clockwise; Red shaded areas (IUCN Categories I-VI) refer to protected areas like national parks

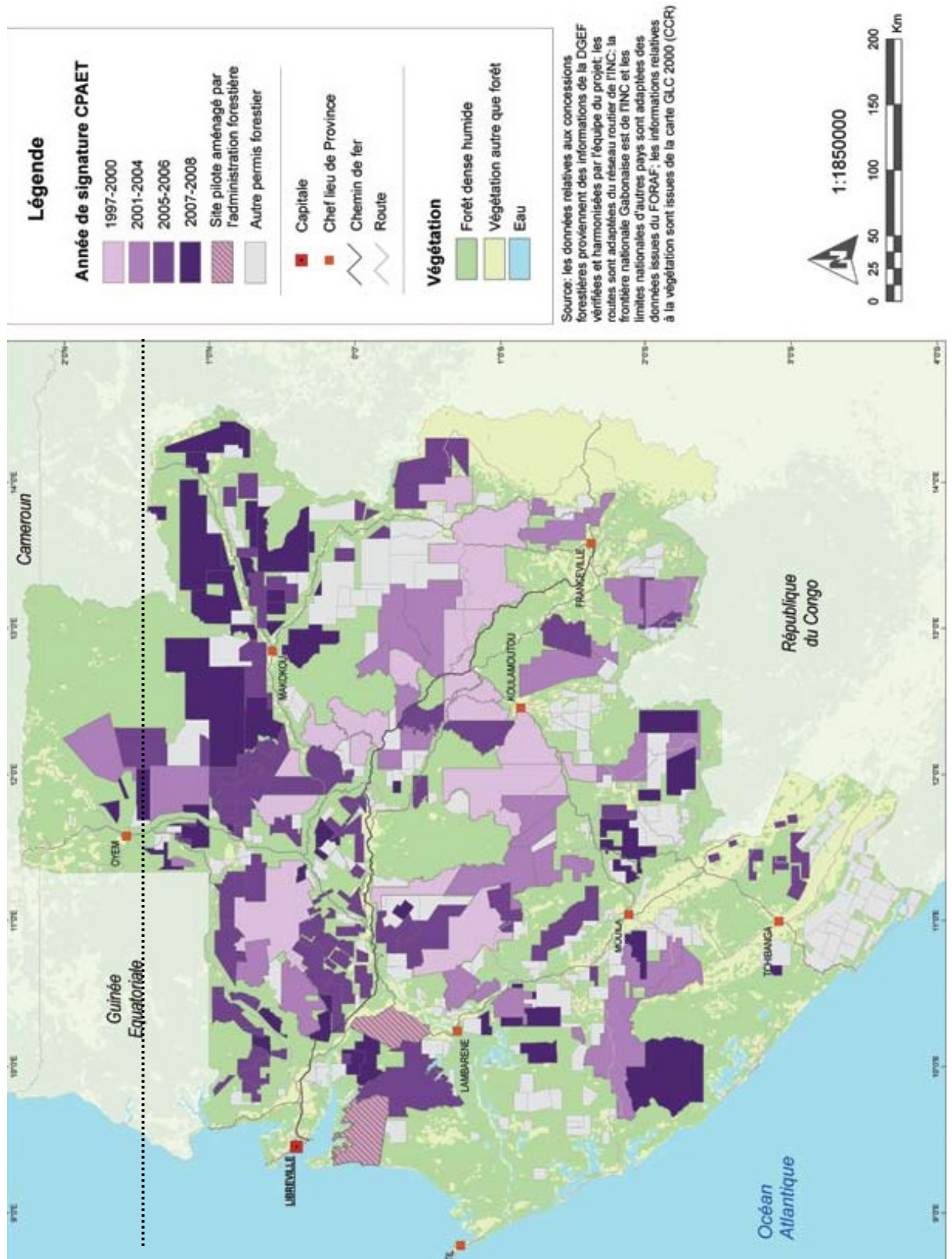


**Map A-2** Concession areas in Gabon, differentiated by nationality (CFAD/CPAET concessions only, 2008)



Source: Makak and Mertens (2009, p. 31)  
 Notes: Map turned 90° counter clockwise; Dashed line represents the approximate upper border of Map A-1; Legend: France (dark blue), Malaysia (purple), China (pink), Gabon (light blue), Others (grey)

**Map A-3** Concession areas in Gabon, differentiated by CPAET signatory date (CFAD/CPAET concessions only, 2008)



Source: Makak and Mertens (2009, p. 37)

Notes: Map turned 90° counter clockwise; Dashed line represents the approximate upper border of Map A-1; Legend: pilot site of forest administration (pink dashed), Other permits (grey)



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