Do we have to look at China to tell our fortune?

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Like so many things like fireworks and chop-sticks, fortune cookies were invented by the Chinese in 1909 but not in Peking or Shanghai but in San Francisco. The real secret is the message on a slip of paper carefully hidden inside the cookie. Traditionally, the message is in the form of a proverb or prediction. They are all secret until the cookie is opened.

http://www.fortune-cookies.co.uk/what_is_a_fortune_cookie.htm)

A truly wise man never plays leapfrog with a unicorn.

If at first you don't succeed, redefine success.

(http://www.new-year.co.uk/chinese/cookie.cfm)

I. Introduction

China's recent impressive entrance into the League of Trading Nations is met with the same awe and dread as the remarkable rise of Japan and the Asian Tigers, Pussycats and Flying Geese in earlier decades.

In an historical perspective, China is now gradually regaining the position- that it held for centuries- as a dominant player in the World Economy. In the period 1820-1952, when world output and per capita income increased dramatically in the US, Europe and Japan, China's share of world GDP decreased from 1/3 to 1/20 and its real GDP per capita fell from parity to a quarter of the world average. China's bureaucratic system confined international trade and intellectual contacts. This self-imposed isolation undoubtedly explains why the country could not follow the pace of innovation and productivity of the emerging capitalist nations (Maddison 1998, pp. 14-15).

It was not until the economic reforms, initiated in 1978, that the country started to witness economic growth well above the world average. The reforms were carried through gradually and in 1992 Deng Xiaoping defined a socialist market economy as a market system that is compatible with the ideals of socialism. This pragmatic view led to a further opening of the Chinese economy through trade liberalization, the welcoming of foreign direct investment and WTO membership in 2001. Since 1979, China's exports and imports have grown by 15 percent on average, compared to a 7 percent world

average growth. However, this growth record is not unprecedented as in the past Japan and some of the Asian Newly Industrialized Countries (NIC) had higher export rates than China for more than 30 years (Prasad and Rumbaugh 2004, p. 1).

Nevertheless, China's swelling exports towards the US and the EU elicit calls for protectionist measures. Being accused of preserving an unfair competitive advantage through the artificial undervaluation of its currency, China announced (21st July 2005) that the yuan would no longer be pegged to the US dollar but to a non-divulged basket of foreign currencies. It seems rather unlikely that the revaluation by 2.1 percent (from 8.278 to 8.11 yuan per dollar) will substantially decrease the large bilateral trade deficits of the US and most EU countries. Actually, China's overall trade surplus is not extremely large as it runs substantial trade deficits with many of its Asian neighbours. Given the sheer size of the country, China accounts for a very substantial part of the growth of the world economy (e.g. almost a quarter of world growth over the period 2001-2004).

In contrast with the general view that the yuan is indeed undervalued, existing studies provide a wide range of estimates with respect to China's equilibrium exchange rate that do not provide unambiguous conclusions (Prasad and Rumbaugh 2004; Special 2004 issue on the yuan in *China Economic Review* Volume 15). The fact that China has a trade surplus with respect to most Western countries but a trade deficit with respect to many Asian countries seems to reflect outsourcing activities in Asia, with China focusing on the final processing and assembly of imports going from other Asian countries to Western countries, through China (Prasad and Rumbaugh 2004).

An increasing number of people, mostly without economic declination, consider the fact that many industrialized countries are facing decreasing shares in world exports, to the benefit of emerging economies like China, as an unambiguous threat to their countries welfare.

Krugman (1994) already dismissed former U.S. president Clinton's view of nations as corporations competing in the global marketplace as "flatly" wrong and dangerous. In his view the term competitiveness does not apply to nations. He argues that shifts in world market shares should not be interpreted as an indicator of shifts in the international

competitiveness of countries but rather as an indicator of a shift towards a more efficient allocation of production factors in line with each country's comparative advantage.

Lall (2001) and Lall and Albaladejo (2004) counter-argue that although in theory international free trade is indeed a positive sum game that benefits all countries, the assumptions underlying the theoretical models are often unrealistic and simplifying (e.g. perfect competition, homogenous products, complete costless technology spillovers, no scale economies). Countries that do not unconditionally believe that all assumptions hold can actually improve national welfare through policies that remedy or play off market failures, e.g. by capitalizing on the monopoly power of domestic firms in foreign markets. Krugman (1996) acknowledges the theoretical sophistication of a "Strategist" view on international competitiveness but points out that most new trade theorists (e.g. Krugman himself) believe that the potential gains from trying to exploit market failures are small and that the subtlety of strategic trade theory is not likely to be a match for the turbidity of real world policies.

Reviewing the empirical work of China's impact on the world economy, Prasad and Rumbaugh (2004) conclude that those Asian NIC that have a complementary trade pattern with China benefit from processing trade but that China could start to pose a "competitive threat" if it moves up the value-added chain. Some South(east) Asian countries will have to raise productivity and innovation to face China's competing exports in labor-intensive products. With respect to the most developed countries the authors reason that these can gain from China's emergence by shifting towards more skill- and capital-intensive activities (Prasad and Rumbaugh 2004, p. 13). Shafaeddin (2004) and Lall and Albaladejo (2004) also argue that countries with a comparative advantage in capital- and resource-intensive products are likely to benefit most from China's economic growth whereas countries with a comparative advantage in labour-intensive products may suffer.

Wong (2003) proposes a theoretical framework to analyze the potential impact of trade liberalization by China resulting from the obligations that follow from its WTO membership. Going beyond the rivalry between products of China and Southeast Asian

countries in third markets, the proposed model shows that China's trade liberalization could affect terms of trade and thereby the trade volumes and welfare of other (Asian) countries. Wong points out that a more detailed analysis of China's WTO membership should also take into account the substantial intra-industry trade between China and Southeast Asian countries as well as direct investment of these countries to China.

Samuelson (2004) demonstrates how, in a Ricardian framework, in contrast with the traditional economist view, a country (e.g. the United States) may actually be negatively affected, even in the long-term, by an exogenous productivity gain in another country (e.g. China). He does not conclude that this warrants protectionism though, as this type of 'harmful' innovation could very well be outbalanced by other types of innovations, leaving free trade to be preferred to "*lobbyist-induced tariffs and quotas which involve both perversion of democracy and nonsubtle dead-weight distortion losses*" Samuelson (2004, p. 143).

However, some of the foregoing arguments show that although the "competitiveness" of nations is indeed a far more complicated and less self-evident issue than the "competitiveness" of corporations, a part of the shift in international trade volumes may actually reflect that some countries are losing market shares because of a decrease in attractiveness of their goods on the world market.

In this paper a dynamic shift share analysis is performed for a group of nineteen (mostly OECD) countries. The computed **market share** effects are used as a proxy for the "competitiveness" of each individual country, which are then regressed on the "competitiveness" of other countries, e.g. China.

The aim of the paper is limited, as a detailed analysis of the impact of China on other countries obviously calls for a more elaborated theoretical framework as well as an empirical methodology that is not subject to justifiable criticism as is a shift share analysis. However, I believe that the paper can offer some insight into which countries are, on average, most affected in the world market.

In section II some recent general trends in international trade are presented. Section III reports computed Revealed Comparative Advantage (RCA) measures to get some idea of the similarity in trade patterns between the countries considered. The actual shift share analysis is discussed in section IV. After having computed the **market share** effects in section IV, in section V these effects are used in a regression to estimate the sign and statistical significance of the impact of other countries. Finally, some concluding remarks are given in section VI.

II. Recent General Trends in International Trade

In 2004, developing countries gained a 31% share in world merchandise trade, unprecedented since 1950. The fact that even Africa has been performing well, with its exports increasing by 30% and its production expanding by 4% seems to warrant some optimism, although a substantial part of the good performance is explained by the rise in prices of raw materials (WTO 2005)[1].

**Figure 1: Growth in volume of world merchandise trade and GDP (1994-2004)**
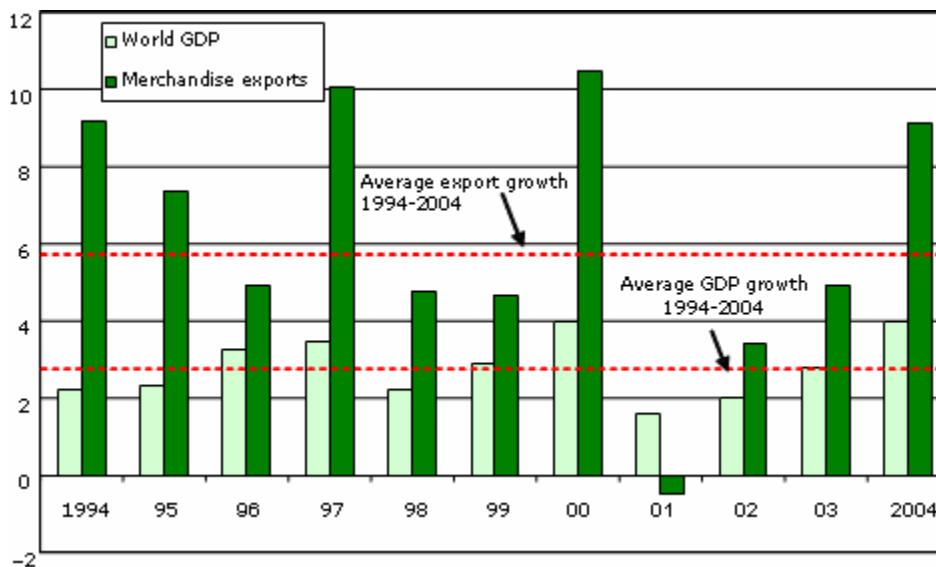
Source: WTO (2005).

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[1] Actually, the dramatic increase in China's demand for raw materials explains a very large part of the increase in these prices.

As shown in figure 1, world merchandise exports and world GDP have recovered from the substantial 2001 slowdown, with world trade again increasing far more than world GDP.

As shown in figure 2, Asia witnessed the highest growth in merchandise exports in 2004, fuelled by the export performance of China, Korea, Singapore and also to a lesser extent by Japan. South and Central America and the Commonwealth of Independent States (CIS) also witnessed substantial growth in exports but in these regions imports clearly outstripped exports. Growth in exports of Africa and the Middle East, expressed in real terms, was far less impressive than growth in nominal terms explained by the 2004 surge in oil prices. For these countries the real growth in imports was more than twice real growth in exports. North America and Europe had real exports growth rates below the world average. The fact that Europe was the only region for which imports grew slower than exports probably reflects weak domestic demand in Western Europe. East European countries had growth rates in exports and imports well above the world average (WTO 2005).

Figure 2: Real merchandise trade growth by region (2004)

Source: WTO (2005).

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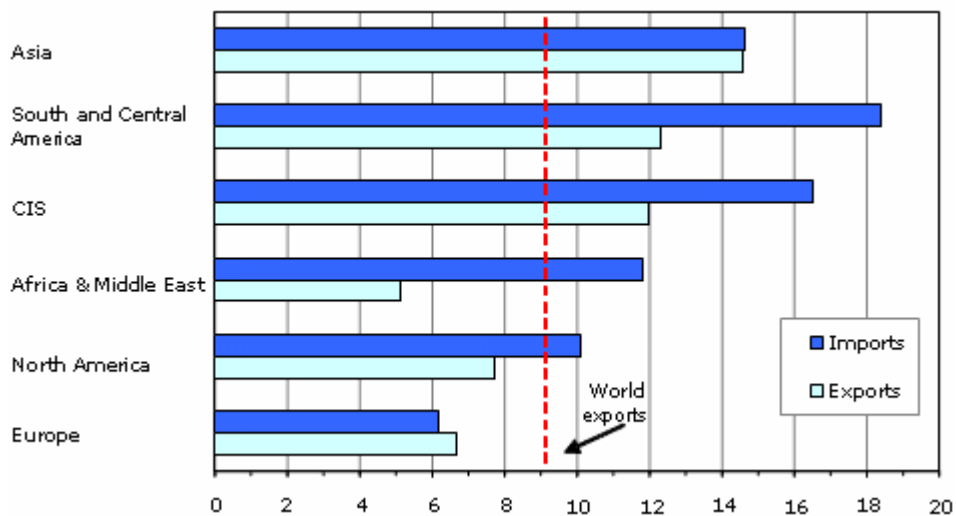
Looking at recent international trade flows of a selection of individual countries, table 1 clearly shows the rather exceptional performance of China, ranking first, over the period 1999-2004, in terms of growth in world merchandise exports share, world merchandise imports share and growth in the value of world merchandise exports. Poland, Hungary and Korea follow at a modest distance. Table 1 also reveals the substantial differences between OECD and EU15 countries, with Japan, the UK and the USA performing rather poorly in terms of growth in exports. The last column in table 1 shows the increase in the trade surplus over the period 1999-2004 relative to the 1999 value of exports. The latter provides a different ranking with China, given its high increase in imports, now somewhere in the middle and mostly EU15 countries topping the list, reflecting low domestic demand.

Table 1: Growth in country shares of total merchandise world trade (1999-2004)

	growth share exports		growth share imports		growth value exports		growth relative trade surplus
China	0.90	China	1.11	China	2.04	Ireland	0.27
Poland	0.69	Hungary	0.32	Poland	1.70	Germany	0.24
Hungary	0.35	Poland	0.19	Hungary	1.17	Poland	0.17
Korea	0.11	Korea	0.17	Korea	0.77	Netherlands	0.12
Austria	0.10	Spain	0.15	Austria	0.75	Austria	0.09
Belgium	0.08	Belgium	0.09	Belgium	0.72	Sweden	0.08
Spain	0.07	Greece	0.09	Spain	0.71	Denmark	0.08
Germany	0.05	Austria	0.01	Germany	0.68	Belgium	0.04
Netherlands	0.03	Finland	-0.01	Netherlands	0.64	Korea	0.04
Hong Kong	-0.05	Italy	-0.01	Hong Kong	0.52	China	0.01
Denmark	-0.06	Netherlands	-0.03	Denmark	0.50	Japan	0.01
Italy	-0.08	Germany	-0.06	Italy	0.47	Finland	0.00
Ireland	-0.09	Hong Kong	-0.06	Ireland	0.46	Hong Kong	-0.01
Finland	-0.09	France	-0.08	Finland	0.45	Mexico	-0.06
Sweden	-0.11	Denmark	-0.08	Sweden	0.43	France	-0.07
Portugal	-0.11	Japan	-0.09	Portugal	0.43	Italy	-0.08
France	-0.13	United States	-0.10	France	0.39	Hungary	-0.08
Mexico	-0.13	Sweden	-0.11	Mexico	0.38	Portugal	-0.14
Japan	-0.15	UK	-0.11	Japan	0.35	UK	-0.23
Greece	-0.17	Mexico	-0.12	Greece	0.33	Spain	-0.38
UK	-0.21	Portugal	-0.16	UK	0.27	United States	-0.49
United States	-0.26	Ireland	-0.20	United States	0.18	Greece	-1.70

Source: Own calculations based on data from WTO Statistics Database.
Note: Growth relative trade surplus is change of trade surplus between 1999 and 2004 relative to value of exports in 1999.

III. Comparative Advantage

According to traditional trade theories countries can benefit from international trade by specializing in the production of those products for which they have a comparative advantage. Revealed comparative advantage (RCA) is a widely used- though not un-discussed- empirical measure of comparative advantage (e.g. Bowen, Hollander and Viaene 1998):

$$RCA_{ij} = \left(\frac{X_{ij}}{X_j} \right) / \left(\frac{X_i}{X} \right)$$

X_{ij} denotes country I's exports in product J, $X_i = \sum_j X_{ij}$; $X_j = \sum_i X_{ij}$ and $X = \sum_i \sum_j X_{ij}$.

If for a given product a country has a RCA greater than 1 that country is said to be, relatively to the reference group of countries, specialized in that good and vice versa for a RCA smaller than 1.

For the empirical analysis in this paper data on exports were retrieved from the OECD International Trade by Commodities Statistics (2002/2) for the period 1991-2001. The data permits to create comparable time series for the period 1993-2000 for the following countries: Austria, Belgium, Canada, China, Denmark, Finland, France, Germany, Hong Kong, Hungary, Ireland, Italy, Japan, Netherlands, Poland, Spain, Sweden, UK and USA. Taking into account product heterogeneity, all calculations have been performed at the lowest level of aggregation, excluding *Food and live animals* (SITC 0); *Beverages and tobacco* (SITC 1); *Crude materials, inedible, except fuels* (SITC 2); *Mineral fuels, lubricants and related materials* (SITC 3) and *Animal and vegetable oils, fats and waxes* (SITC 4). The highest level of product detail is the Standard International Trade Classification (Revision 3) five-digit level, except for a number of product categories which are only provided at the four-digit SITC level. The export value of a number of commodities oscillates wildly over the years or is dominated by a very small group of countries or even a single country. To avoid the bias of these commodities the following commodities were not considered for analysis: *Spent fuel elements of nuclear reactors*

(SITC 52517); *Inuline* (SITC 59216); *Yarn of coarse animal hair or horsehair* (SITC 65115); *Diamonds (excluding industrial), not mounted or set* (SITC 6672); *(semi) precious stones, not strung, mounted or set* (SITC 6673); *Fuel elements, non irradiated* (SITC 71877); *Nuclear reactors* (SITC 71871); *Parts of nuclear reactors* (SITC 71878); *Tanks & armoured righting vehicles, motorized* (SITC 89111); *Military weapons-excluding revolvers, pistols, side arms* (SITC 89112) and *Side arms & parts thereof & scabbards & sheaths* (SITC 89113) .

Further excluding SITC categories like *Intrastat: estimation of missing declarations of section*; *confidential trade*; *Sets of division*; *Components of complete industrial plants of division*; *Merchandises carried by post and not elsewhere specified*; *Special transactions and commodities not classified* and *Intra E.C trade not classified by commodities* finally results in 2191 five-digit SITC commodities and 144 four-digit SITC commodities.

For the reference group of nineteen countries, table 2 reports China's twenty products with the highest RCA for 1994 and 2000[2].

Table 2: China's twenty products with highest RCA for 1994 and 2000

Product	RCA 1994	Product	RCA 2000
67122 Non alloyed pig iron, weight > 0, 5% phosphorus	56.50	68724 Tin tubes, pipes and tube or pipe fittings	30.33
65844 Table linen, knitted or crocheted	54.38	67269 Other semi fin. prod., iron, non al. steel, <0, 25%ca.	23.03
65144 Sewing thread of artificial staple fibres	50.31	7863 Containers	18.14
65811 Sacks & bags, of textile bast fibres of heading 264	44.96	52229 Calcium, strontium & baryum; scandium & yttrium	17.01
89733 Articles of nat. or cultur. pearls, precious stones	44.62	84323 Jackets & blazers, knitted or crocheted, for men	15.28
67154 Ferro silico chromium	42.01	89478 Gymnasium or athletic articles & equipment	14.67
68993 Antimony & articles thereof incl. waste & scrap)	40.47	65192 Silk yarn (excluding spun), not put up for retail sale	14.51
68982 Cadmium, unwrought; cadmium waste & scrap; powders	37.62	67241 Ingots of iron (excluding 671339) or non alloy steel	14.03
65929 Carpets, floor coverings, knotted, other textile mat.	36.52	88112 Flashbulbs, flashcubes & the like	14.02
65921 Carpets, floor coverings, knotted, wool or fine hair	36.06	89974 Nats, matting & screens of vegetable materials	13.54
66711 Natural pearls, not strung, mounted or set	33.84	67154 Ferro silico chromium	13.47
84123 Ensembles, for men	32.00	69638 Parts, n.e.s., of non0electric razors, excluding plastics	13.37
88552 Watch movements, neither battery nor accum. powered	30.37	67122 Non alloyed pig iron, weight > 0, 5% phosphorus	13.33
65199 Yarn of other vegetable textile fibres; paper yarn	28.30	89995 Wigs, false beard & simi.; art. of human hair, n.e.s.	12.55
83129 Trunks & similar, outer surface of other materials	27.23	67245 Other primary forms of iron or non alloy steel	12.47
89929 Artificial flowers, foliage, fruits, excludingof plastics	27.02	67121 Non alloyed pig iron, weight < 0, 5% phosphorus	12.08
89426 Toy musical instruments & apparatus	26.67	85123 Other sports footwear, uppers of rubbers or plast.	12.08
67123 Alloy pig iron and spiegeleisen	26.11	65193 Yarn spun from silk waste, not for retail sale	12.07
89971 Articles made directly to shape from plaiting mat.	26.00	89929 Artificial flowers, foliage, fruits, excludingof plastics	11.87
84849 Headgear, n.e.s., of materials excluding rubber or plas.	25.96	56293 Diammonium hydrogenorthophosphate	11.81

Source: Own calculations based on data from OECD (2002)

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[2] The RCA for individual countries are not reported but available upon request.

Non alloyed pig iron, weight > 0, 5% phosphorus (SITC 67122), *Ferro silico chromium* (SITC 67154) and *Artificial flowers, foliage, fruits, excluding of plastics* (SITC 89929) are the only three commodities that appear in the top 20 of both 1994 and 2000.

Even at the 3 digit level only four groups overlap: *Textile yarn* (SITC 651), *Pig iron & spiegeleisen, sponge iron, ...*(SITC 671); *Baby carriages, toys, games & sporting goods* (SITC 894) and *Miscellaneous manufactured articles* (SITC 899).

The top RCA for 1994 are higher than those for 2000, reflecting the fact that China's exports have become more diversified.

In table 3 the correlation (Pearson and Spearman) between the RCA of China and the RCA of the other eighteen countries is given.

Table 3: Correlation between RCA of China and given countries in 2000

	Pearson	Spearman
AUSTRIA	-0.07**	-0.02
BELGIUM	-0.06**	-0.02
CANADA	-0.10**	-0.12**
DENMARK	-0.04*	0.11**
FINLAND	-0.10**	-0.04
FRANCE	-0.16**	-0.13**
GERMANY	-0.28**	-0.29**
HONG KONG	0.22**	0.26**
HUNGARY	0.01	0.17**
IRELAND	-0.05*	0.09**
ITALY	-0.04*	0.07**
JAPAN	-0.15**	-0.13**
NETHERLANDS	-0.10**	-0.05*
POLAND	0.11**	0.13**
SPAIN	-0.05*	0.06**
SWEDEN	-0.14**	-0.12**
UK	-0.15**	-0.08**
USA	-0.20**	-0.24**

Note: **, * denotes significance (two-sided) at respectively the 0.01 and the 0.05 level.

Hong Kong, Hungary and Poland are the only countries with both a positive Pearson and Spearman correlation. Denmark, Ireland, Italy and Spain have a negative Pearson

correlation coefficient but a positive Spearman correlation coefficient with for all four countries the Spearman correlation being more significant than Pearson correlation. For the other countries all correlation coefficients are negative.

Using the RCA computed for all individual countries, figure 3 maps the similarity in export specialization between the countries of the reference group for the year 2000. The common space has been created with the multidimensional scaling procedure PROXSCAL in SPSS 12. Not too surprisingly Hong Kong is closest to China. Denmark, Ireland, Italy and Spain are also close to China, in line with the significantly positive Spearman correlation. On the other hand Hungary and Poland are rather distanced from China in the common space, in spite of a positive Pearson and Spearman correlation.

Figure 3: Common space reflecting similarity in RCA (2000)
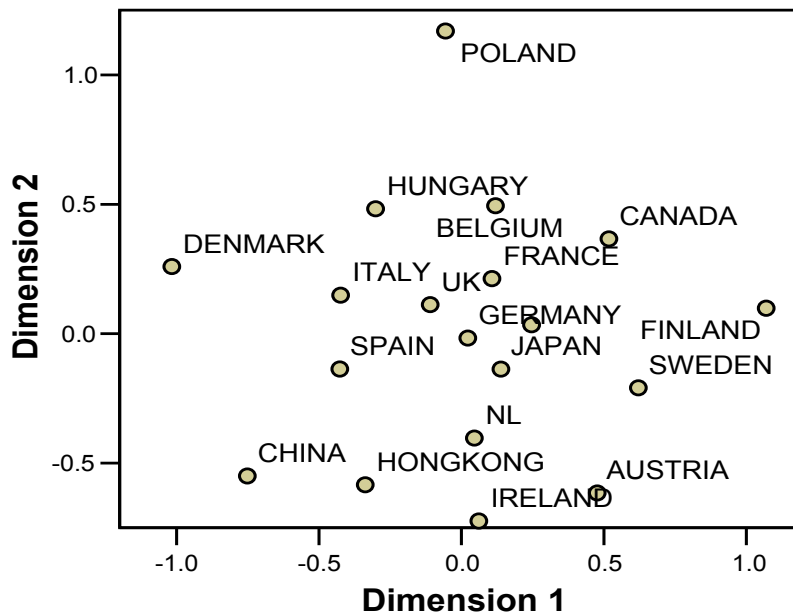
Note: The figure is a common space obtained by running the multidimensional scaling procedure PROXSCAL in SPSS. The RCA for the reference group of nineteen countries are used to estimate the distance between the countries considered.

IV. Shifting Shares

The computed revealed comparative advantage measures, reported in the previous section, suggest little similarity in export specialization between China and most OECD countries. However, this does not necessarily imply that the exports of China do not have an impact on the market shares of these countries. Lall and Albaladejo (2004) assess the potential competitive threat of China with respect to its Asian neighbours by examining the degree to which the sign of changes in market shares of products of China coincides or differs from the sign of market share changes of other countries. There are five possible qualifications of competitive threat:

- **Direct threat**: If a given country witnesses a decrease in its market share for a given product and the market share of China for that product increases, China is assumed to pose a direct competitive threat for that country with respect to the given product.
- **Partial threat**: The given country and China both increase their market share for a given product but the market share of China increases faster.
- **No threat**: The given country and China both increase their market share for a given product and the market share of China increases slower.
- **China under threat**: The given country witnesses an increase in its market share whereas China loses market share.
- **Mutual withdrawal**: The given country and China both witness decreasing market shares for a given product.

Lall and Albaladejo (2004) concede hat there is a substantial caveat in inferring a competitive threat from combinations of changes in market shares for a given product. If the economically more developed countries relocate labour-intensive activities to China, as is the case for a number of Asian neighbours, the exports of China may increase at the expense of its neighbours. However, the neighbouring countries actually increase their

competitive advantage as well as exports of intermediates; design and marketing activities and dividends.

Being aware of the limitations, table A.1 (appendix) shows, for the countries of the reference group in the period 1994-2000, the potential competitive threat of China, in the terms of Lall and Albaladejo (2004), considering the share of the five possible market share change combinations in the total number of commodities at the highest level of product detail.

For most countries the percentage of commodities for which China can be considered as a direct threat increased over the period considered. Actually the percentage in 2000 clearly exceeds the percentage of previous years for most countries. Somewhat in contrast with this general trend the percentage of commodities under direct threat hardly changed or even decreased for Canada, Hong Kong, Ireland, Japan, Poland and the United States.

Considering eight Asian countries, Lall and Albaladejo (2004) also find that the percentage of commodities under direct threat decreased over the period 1990-2000 for Hong Kong, although the percentage for 2000, i.e. 88.9% found by them is substantially higher than the percentage reported in table 4, i.e. 23%. This can probably be explained by the fact that Lall and Albaladejo work at a higher level of product aggregation, i.e. SITC three-digit. Given the high degree of product heterogeneity within three-digit classes an analysis at a lower level of disaggregation seems warranted.

For the year 2000 Germany, France, Sweden, Belgium, Italy and the UK top the list of countries with respect to the percentage of commodities under direct threat.

The relationship between similarity in exports, as proxied by the RCA reported in the previous section, and the percentage of commodities under direct threat apparently weakened over the period 1994-2000. Whereas in 1994 the correlation between the correlation of China's RCA and other countries' RCA and the percentage of commodities under direct threat was 0.24 it turned negative in 1995 to reach -0.48 in 2000.

This seems to suggest that similarity in RCA is not a good proxy for the degree of a country's competitive threat as most EU countries had a negative correlation between their RCA and China's RCA but appear to have witnessed a direct threat from China for a large share of their commodities.

The dynamics of export market shares is traditionally examined with a shift share or constant market share analysis.

In a shift share analysis the growth in the market share of a country with respect to the world or a reference group of countries is decomposed into a number of effects (e.g. Richardson 1971; Barff and Knight 1988):

$$\Delta XS_{i,t} = XS_{i,t} - XS_{i,t-1} = \sum_j \left(\frac{X_{ij,t}}{X_{j,t}} - \frac{X_{ij,t-1}}{X_{j,t-1}} \right) . \frac{X_{j,t-1}}{X_{t-1}} + \sum_j \left(\frac{X_{j,t}}{X_t} - \frac{X_{j,t-1}}{X_{t-1}} \right) . \frac{X_{ij,t-1}}{X_{j,t-1}}$$

$$+ \sum_j \left(\frac{X_{ij,t}}{X_{j,t}} - \frac{X_{ij,t-1}}{X_{j,t-1}} \right) . \left(\frac{X_{j,t}}{X_t} - \frac{X_{j,t-1}}{X_{t-1}} \right)$$

$XS_{i,t} = \dfrac{X_{i,t}}{X_t}$; $X_{ij,t}$ denotes country I's exports in product J at time T,

$X_i = \sum_j X_{ij}$; $X_j = \sum_i X_{ij}$ and $X = \sum_i \sum_j X_{ij}$.

The first term of the right-hand side reflects how much the overall market share of country I would have changed if the commodity mix (shares of different SITC commodities) would have been fixed. As such it can be considered as a **competitiveness effect**[3]. The second term measures the change in country I's overall market share explained by a change in the commodity mix of exports of the reference group. This **commodity mix effect** therefore reveals whether a country is specialized in commodities that are becoming more important or in commodities that are losing shares in the total market value. The last term is an interaction effect revealing the extent to which a country is moving towards commodities that gain market shares or moving out of activities that are less promising due to decreasing overall market shares and can therefore be considered as a **market adaptation effect** (e.g. Fagerberg and Solie 1987).

Shift share analysis is often performed with changes over a given period of a number of years. Chern, Wilson and Chuan (2002) argue that if the commodity mix changes

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[3] This effect is often called the **market share** effect. The interpretation of this effect as an indicator of "competitiveness" is indeed open to question (e.g. Michel 2005). However, in this paper this effect is considered as a proxy for competitiveness and therefore will be labeled as such in the full knowledge of its limitation as well as the more general caveats of shift share analysis (e.g. Chern, Wilson and Chuan 2002).

substantially over the period considered this can result in biased effects. They therefore opt for a dynamic shift share analysis (e.g. Barff and Knight 1988) considering changes over one year, thereby automatically updating the **commodity mix** effect each year.

Weiss and Shanwen (2003) applied a shift share analysis to six ASEAN countries. Using the share effect as a measure of competitiveness they find that the ASIAN countries considered have been exposed to increasing competition from China, in the United States and Japan.

Given the potentially large changes in the **commodity mix**, changes in market shares are computed and decomposed for each year in the period 1993-2000. Commodities are again considered at the highest possible level of detail (i.e. 2191 commodities at the five-digit SITC level 144 commodities at the four-digit SITC level). Only exports to North America, Europe and Asia are considered.

The results for each individual country and each year are shown in table A.2 in the appendix. In Table 4, average annual effects over the period considered for each of the three shift share effects is shown, ranked in decreasing order for each effect[4]. The last two columns give the ranking of the relative growth in market shares. As can be seen in table A.2 the average annual effects hide substantial variation over the years. Computing the share effects over a longer period of time (e.g. five years) as is often done, is likely to overlook this annual variation.

China clearly had the highest positive **competitiveness** effect, with an annual growth of 0.5% in its market share. However, China is second to last with respect to the **commodity mix** effect and the **adaptation** effect is only moderately positive. The US, Spain, Ireland, Hungary, Finland and the UK are the only countries for which all three effects, on average, are positive for the period 1994-2000. Especially the United States seems to have been performing rather well with the second highest positive **competitiveness** and

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[4] Though these results are not entirely comparable to the estimations by Michel (2005) who performs an analysis for 62 destination countries and 72 products over the respective periods 1991-1997 and 1997-2001, overall the results seem fairly similar.

the highest positive **commodity mix** effect. As shown in table 1, more recently (1999-2004) the United States witnessed a substantial loss in its world market share.

Table 4: Average annual shift share effects and relative growth market shares (1994-2000)

country	Competitiveness	country	Commodity mix	country	Adaptation	country	Rel. growth
CHINA	0.47	US	0.14	HONG KONG	0.04	HUNGARY	16.45
US	0.16	JAPAN	0.09	IRELAND	0.03	IRELAND	10.77
CANADA	0.10	IRELAND	0.04	JAPAN	0.02	CHINA	9.03
SPAIN	0.09	SWEDEN	0.04	CHINA	0.01	POLAND	7.40
IRELAND	0.08	UK	0.03	UK	0.01	FINLAND	2.85
HUNGARY	0.07	FINLAND	0.01	US	0.01	SPAIN	2.43
POLAND	0.06	NL	0.00	HUNGARY	0.00	US	2.14
FINLAND	0.01	HUNGARY	0.00	DENMARK	0.00	CANADA	1.98
UK	0.00	DENMARK	0.00	FINLAND	0.00	UK	0.73
BELGIUM	-0.01	AUSTRIA	-0.01	BELGIUM	0.00	SWEDEN	0.47
SWEDEN	-0.02	FRANCE	-0.01	POLAND	0.00	BELGIUM	-0.82
AUSTRIA	-0.02	POLAND	-0.01	NL	0.00	FRANCE	-1.08
DENMARK	-0.02	BELGIUM	-0.03	AUSTRIA	0.00	HONG KONG	-1.15
FRANCE	-0.05	CANADA	-0.03	SPAIN	-0.01	GERMANY	-1.29
HONG KONG	-0.07	SPAIN	-0.03	CANADA	-0.01	AUSTRIA	-1.47
ITALY	-0.08	HONG KONG	-0.04	SWEDEN	-0.02	NL	-2.01
NL	-0.08	GERMANY	-0.05	ITALY	-0.02	DENMARK	-2.10
GERMANY	-0.13	CHINA	-0.06	GERMANY	-0.03	ITALY	-2.65
JAPAN	-0.57	ITALY	-0.10	FRANCE	-0.03	JAPAN	-2.72

Source: Own calculations based on data from OECD (2002)

Considering relative growth of market shares, Hungary and Ireland actually outperformed China with Poland following at close distance.

Japan witnessed the highest drop in its market share, explained by a negative **competitiveness** effect, as both its **commodity mix** and **adaptation** effect was negative. France and Germany are the only countries for which all three shift share effects are negative on average.

Michel (2005) decomposed market shares by destination country. Over the period 1991-1997 he found that for most EU countries the world export market share dropped due to the fact that a very large part of their trade is intra-EU and that the share of the EU in world trade decreased from 44.42% in 1991 to 37.25% in 1997. The share slightly increased to 37.44% in 2001, allowing the EU countries to recover part of the lost market shares.

V. Econometric Estimation

In this section the results of an econometric estimation of the impact of China on the export shares of other countries are discussed. For each country the competitiveness effect at the commodity level ($CE_{j, t}$), computed in the previous section, is regressed on trade partners' competitiveness effects for the same commodity.In addition to the main G7 countries China, Hong Kong, Hungary and Poland are considered individually to estimate the impact of these emerging economies. The EU15 countries that do not belong to the G7 are grouped in a EU rest variable. In addition, the growth in the exports of the given commodity in Europe, North America and Asia are considered as control variables and time dummies take into account common annual shocks:

$$CE_{j,t} = \alpha_{China} CE_{China,j,t} + \alpha_{Hong\,Kong} CE_{Hong\,Kong,j,t} + \alpha_{Hungary} CE_{Hungary,j,t} + \alpha_{Poland} CE_{Poland,j,t}$$

$$+ \alpha_{France} CE_{France,j,t} + \alpha_{Germany} CE_{Germany,j,t} + \alpha_{Italy} CE_{Italy,j,t} + \alpha_{UK} CE_{UK,j,t} + \alpha_{US} CE_{US,j,t}$$

$$+ \alpha_{EUrest} CE_{EUrest,j,t} + \alpha_{Europe} \Delta Exports_{Europe,j,t} + \alpha_{America} \Delta Exports_{America,j,t} + \alpha_{Asia} \Delta Exports_{Asia,j,t}$$

$$+ \sum_{t=1995}^{2000} \alpha_t D_t + \varepsilon_{j,t}$$

The specification is estimated with fixed effects, i.e. for each country a panel is estimated with the individual commodities, as unit of observations, having their specific intercept. An F-test indicates whether the assumption of commodity-specific intercepts can be rejected in favour of a specification with a common intercept for all commodities.

The estimation results are reported in table 5. The last row shows whether for the given country a fixed effects (FE) specification is rejected in favour of a plain OLS specification, in which case the latter results are reported.

Although the impact of China's competitiveness on other countries' competitiveness is found to be negative for twelve out of fifteen countries considered, the impact is only statistically significant for six countries: Denmark, Ireland, Italy, the UK, Hong Kong and the United States. The highest negative impact can moreover be found for countries who have witnessed positive overall share growth like Ireland and the United States. On the

other hand, Denmark, Italy and Hong Kong were among the countries with the highest relative market share loss in the period 1994-2000 (see table 4)

The impact of the US is significantly negative for ten countries and the impact of Hong Kong significantly negative for nine countries. The impact of other countries provides a more mixed pattern, e.g. a significant and substantial negative impact of Poland on Germany and of France on the United States.

Japan, for which no results are reported in table 5, apparently witnessed a significant negative impact of all country (groups) considered in the estimation

A striking result of the estimation is that four out of the six countries for which a significant negative impact of China is found (i.e. Denmark, Ireland, Italy and Hong Kong) are closest to China in the common space in figure 3, which reveals the similarity in trade patterns. This seems to suggest a closer link between the negative impact of China as estimated and similarity in trade specialization than between similarity and the % of products considered a direct threat as shown in table A.1.

Table A.1 suggests that the competitive threat of China increased over the years. Taking the possibility of time variant slope coefficients into account, the specification has been re-estimated by interacting the China variable with the time dummies. These estimations resulted in a variating combination of countries with statistically significant negative coefficients for the following countries:

1995: Austria, Italy and United States

1996: Germany, Italy, Hungary and United States

1997: Denmark and Italy

1998: Belgium, United Kingdom and Hong Kong

1999: Finland, Hong Kong, Ireland, Poland, United Kingdom and United States

2000: Denmark, Poland, Sweden, United Kingdom and United States

Table 5: Impact of major countries on export shares of reference group countries (1994-2000)

	AU	BE	DK	FR	DE	IE	IT	NL
China	0.01	-0.04	-0.02***	-0.04	-0.06	-0.21**	-0.15***	0.03
Hong Kong	-0.01	-0.07*	-0.02**	-0.15	-0.09	-0.16***	-0.06***	-0.04
Hungary	-0.09	-0.25**	-0.02	-0.21	-0.33	-0.14	-0.16	-0.25*
Poland	0.08*	-0.14	-0.01	-0.04	-0.53*	-0.14	0.16	-0.07
France	0.01	-0.08*	0.004		0.004	-0.21***	-0.04	0.03
Germany	0.01	0.12	-0.01	-0.01		-0.05	0.08*	-0.001
Italy	0.08**	-0.05	0.01	-0.09	0.32**	-0.07		0.08
UK	0.04	0.03	-0.01*	-0.11*	-0.06	-0.15**	0.03	0.03
US	0.00	0.01	-0.004	-0.23***	-0.13**	-0.17***	-0.04	-0.10***
EU (rest)	0.00	-0.003	-0.003	-0.07	0.13	-0.10**	0.05	-0.06*
R² (adj.)	0.07	0.21	0.03	0.19	0.19	0.12	0.16	0.11
Specification	OLS	FE	OLS	OLS	FE	FE	OLS	FE

	ES	SE	UK	CH	HK	HU	PO	US
China	0.08**	-0.13	-0.14***		-0.19**	-0.01	-0.03	-0.37***
Hong Kong	-0.01	-0.09**	-0.11*	-0.09***		-0.03**	-0.002	-0.42***
Hungary	-0.12*	-0.33**	0.003	-0.03	-0.16		-0.04	-0.33
Poland	0.22	-0.12**	-0.23	-0.19	-0.14	-0.04		-0.62***
France	0.01	-0.01	-0.16**	-0.04*	-0.30***	-0.01	-0.002	-0.81***
Germany	0.14***	0.03	-0.004	-0.16	-0.10	-0.17	-0.02*	-0.26*
Italy	0.26**	0.08	0.07	-0.09*	-0.21***	-0.02	0.04**	-0.22
UK	0.09	-0.06		-0.07**	-0.12	-0.02	-0.02**	-0.40***
US	0.06*	-0.04**	-0.18***	-0.05***	-0.18**	-0.01*	-0.01*	
EU (rest)	0.05	-0.03	-0.05	-0.05**	-0.16***	-0.05***	-0.01	-0.28***
R² (adj.)	0.26	0.11	0.10	0.31	0.21	0.22	0.02	0.39
Specification	OLS	FE	OLS	FE	OLS	FE	FE	FE

Source: Own estimations based on data from OECD (2002). *, **, *** denotes significance at respectively 0.10, 0.05 and 0.01. Columns with OLS for specification report results of a plain OLS estimation (common intercept), columns with FE reports results of a fixed effects estimation (commodity-specific intercepts). Control variables and time dummies are not reported.

Overall these results are in line with the time-invariant slope estimations reported in table 5, with some indications that in the most recent years of the period considered (1999 and 2000) more countries are affeccted by China's increased competitiveness. The negative impact of China on Hong Kong was apparently especially tangible in the two years following the 1997 Asian crisis.

Given the increased importance of foreign outsourcing, the estimation of changes in market shares at the same five-digit level may osbcure the positive impact of increased exports of a trade partner on its imports and thus the exports by other countries of intermediate commodities. To estimate the possible impact of exports in five-digit commodities on trade in intermediates, the trade variables have been interacted with dummies at the SITC three-digit level, i.e. for each five-digit commodity the change in market shares of trade partners at the five-digit SITC level is interacted with 1 if the given commodity has the same SITC three-digit code (but not the same five-digit SITC code) otherwise by 0. Summarizing the results of this estimation by the significant effects:

China: Poland (-)

Hong Kong: France (+), Poland (-) and United States (+)

Poland: China (-) and Hong Kong (-)

France: Hong Kong (+)

Germany: Ireland (+), Netherlands (-) and United Kingdom (+)

Italy: Poland (+)

United States: Denmark (+), Hong Kong (+), Ireland (+) and United Kingdom (+)

United Kingdom: Finland (+) and France (+)

EU (rest): China (-), France (+), Germany (+) and United Kingdom (+)

In contrast with the effects reported in table 5 most of the significant coefficients are positive, although this only seems to apply to the most developed countries, e.g. the positive impact of the United States on four countries. The only significant effect found for China is the negative impact of China's change in market share at the five-digit level

on Poland's changes in the market shares of commodities with the same three-digit SITC code. Poland also has a negative impact on China and Hong Kong. These results indicate the importance to account for a possible positive outsourcing effect though so far this does not seem to apply to China.

The regression specification used so far does not account for the endogeneity of many of the right-hand side variables.

Therefore all individual country equations have been estimated simultaneously using GMM (TSP 4.5). The lagged values of the variables are used as instruments and a mask matrix specifies which of the instruments are used for which equations. In table 6 the significant effects are reported. Far less coefficients appear to be significant when the endogeneity is taken into account. Moreover the effects in many cases also have a different sign. China's competitiveness is not found to have any significant impact at all in any of the countries considered and the impact of the United States is more ambiguous, i.e. positive for France and Ireland and negative for Germany, Italy and the United Kingdom.

Table 6: Impact of major countries on export shares of reference group countries (1994-2000)- GMM simultaneous equations estimation

	BE	FR	DE	IE	IT	UK	US
China							
Hong Kong							
Hungary							
Poland							
France			4.47***			2.04**	
Germany	-2.79***	4.00***		4.90***		-5.38***	-1.84*
Italy				5.19***		-2.15**	
UK		9.15***	-6.33***		-2.21**		-7.35***
US		1.91*	-5.36***	2.23**	-4.57***	-7.37***	
EU (rest)							

Source: Own estimations based on data from OECD (2002). *, **, *** denotes significance at respectively 0.10, 0.05 and 0.01. The table reports results from a Generalized Method of Moments estimation of the system of simultaneous country equations.

VI. Conclusions

The surge in China's exports since the beginning of the 1990s is increasingly considered as a threat to the welfare of other countries. The rise in the country's share in world market exports is seen as an indication of a fall in the international competitiveness of other countries. As China's trade performance is viewed as a result of its unfair policies (e.g. undervalued exchange rate)à calls for protectionism are resounding more loudly everyday in the EU and the United States.

As already pointed out by Krugman (1994), talking about the international competitiveness of nations the same way as talking about the international competitiveness of corporations does not make much sense. From a theoretical perspective changes in countries' share in world markets cannot simply be taken as evidence of decreasing competitiveness as these changes could very well reflect a shift towards a more efficient allocation of resources.

However, trade theories depend on a number of very restricting assumptions, e.g. perfect market competition. Lall and Albaladejo (2004) have argued that countries can actually improve national welfare through policies that remedy or play off market failures, e.g. by capitalizing on the monopoly power of domestic firms in foreign markets.
Moreover, Samuelson (2004) considered a Ricardian theoretical framework to show that a country (e.g. the United States) may actually be negatively affected in the long-term by an exogenous productivity gain in another country (e.g. China).
In this paper changes in market shares have been used to proxy the competitiveness of a group of countries, in the full awareness of the its coarseness. The competitiveness effects, computed from a dynamic shift share analysis (i.e. computing changes for each year of a given period rather than computing changes over the entire period) have been used to estimate the impact of China on the other countries.

Revealed Comparative Advantage (RCA) indices, computed at the highest level of product detail (2191 SITC five-digit products and 144 SITC four-digit products) for a

group of nineteen countries suggests that China's trade specialization pattern is most similar to that of Denmark, Ireland, Italy, Spain and Hong Kong. Considering, as Lall and Albaladejo (2004), the fact that for a given commodity China's market share increases whereas that of a given other country decreases as an indication of China posing a threat to the given country for the given commodity, reveals that overall the percentage of commodities for which China can be said to pose a competitive threat increased over the period 1994-2000.

For the group of nineteen countries there is however a negative correlation between computed RCA indices and the percentage of commodities for which China poses a threat.

Looking at the results of the dynamic shift share analysis, China witnessed the highest average annual growth (0.42 %) in its share in world exports for the period 1994-2000, followed by the United States, Canada, Spain, Ireland, Hungary and Poland. In terms of relative growth, Hungary and Ireland have actually done better than China.

The growth of China's world market share seems for the largest part explained by the competitiveness effects. China's commodity mix effect is, just after Italy, the most negative of all countries considered (-0.6 %) suggesting that the mix of China's export products is so far slowing down the overall increase in its world market share.

Panel estimations of single country equations suggest a statistically significant negative impact of China's competitiveness on Denmark, Hong Kong, Ireland, Italy, the United Kingdom and the United States. However, taking into account the endogeneity of right-hand side variables using a GMM estimation of simultaneous equations the impact of China is no longer significant for any of the countries considered and the impact of other countries, e.g. the United States, is more ambiguous than in the single equation estimations.

These results seem to suggest that- even abstracting from the caveats of considering changes in market shares as an indicator of changes in international competitiveness- the impact of China on most of the countries considered has not been substantial so far and that the rise of China as a world exporter is immoderately considered as a problem for

developed countries. If international trade competition of nations makes any sense at all it is still predominantly among developed countries.

Fortune cookies may foretell a more bleak future when China would witness the type of exogenous productivity gains pointed out by Samuelson (2004).

Lall and Albaladejo (2004) found that China's share in high tech products is increasing substantially. Kwan (2002) contemplates the possibility of a leapfrog scenario with China jumping from specialization in low-tech products to specialization in high-tech products without struggling through medium-tech products, e.g. through foreign technology transfer, but considers such a scenario to be rather unlikely given the lack of human capital.

Krugman is right when he argues that many people focus on international competitiveness to divert the attention from bad domestic policies. A more protectionist stance of developed countries with respect to China seems the last thing needed for a successful conclusion of the ongoing WTO Round. The argument that China is not following all "free trade" rules is undoubtedly well-grounded but sounds very canting coming from most developed countries.

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APPENDIX Table A.1: China's potential competitive threat based on market share change combinations

Country	Year	% direct threat	% partial threat	% no threat	% mutual withdrawal	% China under threat
AUSTRIA	1994	0.47	0.19	0.05	0.19	0.11
AUSTRIA	1995	0.26	0.30	0.17	0.09	0.18
AUSTRIA	1996	0.34	0.13	0.06	0.19	0.27
AUSTRIA	1997	0.40	0.24	0.11	0.14	0.10
AUSTRIA	1998	0.20	0.17	0.16	0.19	0.29
AUSTRIA	1999	0.31	0.19	0.10	0.16	0.24
AUSTRIA	2000	0.53	0.26	0.06	0.08	0.07
BELGIUM	1994	0.33	0.21	0.06	0.10	0.29
BELGIUM	1995	0.40	0.23	0.10	0.14	0.13
BELGIUM	1996	0.23	0.15	0.06	0.20	0.36
BELGIUM	1997	0.45	0.24	0.07	0.11	0.13
BELGIUM	1998	0.16	0.18	0.10	0.27	0.29
BELGIUM	1999	0.27	0.15	0.07	0.34	0.17
BELGIUM	2000	0.56	0.20	0.09	0.07	0.08
CANADA	1994	0.28	0.15	0.03	0.07	0.46
CANADA	1995	0.28	0.44	0.04	0.14	0.11
CANADA	1996	0.18	0.15	0.04	0.40	0.23
CANADA	1997	0.12	0.56	0.09	0.04	0.19
CANADA	1998	0.19	0.12	0.04	0.19	0.46
CANADA	1999	0.09	0.18	0.06	0.10	0.57
CANADA	2000	0.23	0.56	0.07	0.06	0.08
DENMARK	1994	0.38	0.27	0.10	0.08	0.17
DENMARK	1995	0.22	0.33	0.15	0.12	0.18
DENMARK	1996	0.39	0.18	0.09	0.19	0.16
DENMARK	1997	0.54	0.15	0.07	0.17	0.07
DENMARK	1998	0.28	0.20	0.11	0.23	0.19
DENMARK	1999	0.29	0.21	0.11	0.17	0.21
DENMARK	2000	0.53	0.21	0.14	0.07	0.04
FINLAND	1994	0.22	0.37	0.16	0.04	0.20
FINLAND	1995	0.22	0.32	0.17	0.10	0.18
FINLAND	1996	0.24	0.25	0.08	0.22	0.21
FINLAND	1997	0.36	0.30	0.07	0.13	0.14
FINLAND	1998	0.17	0.20	0.07	0.28	0.28
FINLAND	1999	0.37	0.11	0.07	0.29	0.16
FINLAND	2000	0.43	0.44	0.04	0.06	0.03
FRANCE	1994	0.37	0.20	0.06	0.22	0.14
FRANCE	1995	0.26	0.42	0.08	0.10	0.15
FRANCE	1996	0.27	0.20	0.04	0.20	0.28
FRANCE	1997	0.39	0.26	0.05	0.20	0.10
FRANCE	1998	0.23	0.15	0.14	0.14	0.34
FRANCE	1999	0.32	0.23	0.06	0.23	0.17
FRANCE	2000	0.64	0.14	0.05	0.08	0.10
GERMANY	1994	0.30	0.29	0.03	0.11	0.27
GERMANY	1995	0.25	0.46	0.05	0.10	0.15
GERMANY	1996	0.37	0.12	0.02	0.24	0.26
GERMANY	1997	0.54	0.18	0.03	0.13	0.11
GERMANY	1998	0.14	0.24	0.08	0.13	0.42
GERMANY	1999	0.34	0.19	0.04	0.31	0.12
GERMANY	2000	0.65	0.17	0.02	0.10	0.06
HONG KONG	1994	0.47	0.29	0.04	0.07	0.13
HONG KONG	1995	0.35	0.26	0.09	0.15	0.15
HONG KONG	1996	0.25	0.16	0.07	0.19	0.33
HONG KONG	1997	0.39	0.37	0.05	0.11	0.08
HONG KONG	1998	0.38	0.10	0.14	0.15	0.24
HONG KONG	1999	0.30	0.14	0.14	0.09	0.33
HONG KONG	2000	0.23	0.47	0.15	0.03	0.12
HUNGARY	1994	0.28	0.22	0.27	0.08	0.15
HUNGARY	1995	0.26	0.23	0.19	0.15	0.17
HUNGARY	1996	0.18	0.17	0.23	0.16	0.27
HUNGARY	1997	0.16	0.19	0.42	0.06	0.18
HUNGARY	1998	0.09	0.27	0.25	0.09	0.30
HUNGARY	1999	0.28	0.24	0.14	0.09	0.24
HUNGARY	2000	0.35	0.40	0.16	0.02	0.06
IRELAND	1994	0.25	0.38	0.17	0.04	0.16
IRELAND	1995	0.17	0.37	0.20	0.09	0.17
IRELAND	1996	0.10	0.30	0.23	0.09	0.28
IRELAND	1997	0.29	0.30	0.17	0.05	0.19
IRELAND	1998	0.26	0.17	0.12	0.16	0.29
IRELAND	1999	0.16	0.08	0.26	0.09	0.42
IRELAND	2000	0.22	0.53	0.16	0.04	0.05

Country	Year	% direct threat	% partial threat	% no threat	% mutual withdrawal	% China under threat
ITALY	1994	0.54	0.19	0.03	0.14	0.10
ITALY	1995	0.24	0.41	0.07	0.08	0.21
ITALY	1996	0.19	0.23	0.11	0.08	0.39
ITALY	1997	0.62	0.15	0.03	0.14	0.07
ITALY	1998	0.25	0.24	0.06	0.24	0.21
ITALY	1999	0.42	0.19	0.04	0.20	0.15
ITALY	2000	0.54	0.27	0.05	0.06	0.08
JAPAN	1994	0.35	0.31	0.03	0.20	0.11
JAPAN	1995	0.58	0.24	0.02	0.10	0.06
JAPAN	1996	0.44	0.10	0.01	0.38	0.07
JAPAN	1997	0.46	0.30	0.03	0.11	0.10
JAPAN	1998	0.44	0.05	0.01	0.40	0.09
JAPAN	1999	0.16	0.34	0.09	0.07	0.34
JAPAN	2000	0.22	0.53	0.07	0.04	0.14
NL	1994	0.48	0.21	0.04	0.16	0.10
NL	1995	0.27	0.37	0.09	0.10	0.16
NL	1996	0.27	0.20	0.13	0.21	0.20
NL	1997	0.44	0.28	0.06	0.13	0.09
NL	1998	0.25	0.26	0.05	0.21	0.22
NL	1999	0.22	0.24	0.10	0.17	0.27
NL	2000	0.53	0.22	0.09	0.07	0.10
POLAND	1994	0.27	0.25	0.25	0.10	0.14
POLAND	1995	0.15	0.28	0.25	0.06	0.25
POLAND	1996	0.19	0.18	0.23	0.13	0.27
POLAND	1997	0.29	0.31	0.15	0.11	0.13
POLAND	1998	0.14	0.15	0.19	0.10	0.42
POLAND	1999	0.28	0.25	0.13	0.13	0.20
POLAND	2000	0.28	0.43	0.18	0.03	0.07
SPAIN	1994	0.17	0.22	0.18	0.04	0.39
SPAIN	1995	0.14	0.52	0.13	0.07	0.15
SPAIN	1996	0.09	0.19	0.16	0.12	0.45
SPAIN	1997	0.48	0.22	0.08	0.08	0.14
SPAIN	1998	0.11	0.19	0.16	0.13	0.42
SPAIN	1999	0.23	0.21	0.07	0.32	0.16
SPAIN	2000	0.36	0.48	0.06	0.05	0.05
SWEDEN	1994	0.28	0.23	0.09	0.24	0.16
SWEDEN	1995	0.26	0.34	0.16	0.11	0.14
SWEDEN	1996	0.16	0.22	0.13	0.23	0.26
SWEDEN	1997	0.47	0.17	0.04	0.24	0.09
SWEDEN	1998	0.28	0.11	0.07	0.32	0.22
SWEDEN	1999	0.28	0.30	0.05	0.25	0.11
SWEDEN	2000	0.60	0.23	0.06	0.08	0.04
UK	1994	0.22	0.37	0.08	0.11	0.22
UK	1995	0.36	0.34	0.05	0.12	0.13
UK	1996	0.18	0.25	0.11	0.11	0.35
UK	1997	0.21	0.37	0.15	0.11	0.16
UK	1998	0.32	0.13	0.06	0.29	0.21
UK	1999	0.37	0.18	0.04	0.21	0.19
UK	2000	0.54	0.26	0.05	0.08	0.08
US	1994	0.38	0.26	0.05	0.18	0.13
US	1995	0.57	0.17	0.04	0.12	0.11
US	1996	0.18	0.26	0.09	0.20	0.27
US	1997	0.25	0.37	0.11	0.05	0.22
US	1998	0.21	0.22	0.14	0.23	0.20
US	1999	0.28	0.33	0.06	0.13	0.20
US	2000	0.32	0.42	0.06	0.08	0.12

Source: Own calculations based on data from OECD (2002).

Table A.2: Shift share effects 1994-2000

country	year	Competitiveness	Commodity mix	Interaction	Growth share	Relative growth	Share
CHINA	1994	0.703	0.023	0.030	0.757	19.78	4.58
FINLAND	1994	0.102	0.012	-0.002	0.113	11.88	1.06
IRELAND	1994	0.082	0.024	0.007	0.112	11.15	1.12
POLAND	1994	0.045	0.010	-0.005	0.050	9.73	0.56
SPAIN	1994	0.172	-0.011	-0.001	0.161	7.06	2.43
HUNGARY	1994	0.017	0.004	-0.001	0.020	6.60	0.32
UK	1994	0.341	0.021	0.016	0.378	6.01	6.67
SWEDEN	1994	0.019	0.033	-0.011	0.042	1.93	2.20
CANADA	1994	0.076	-0.008	-0.022	0.046	1.42	3.27
BELGIUM	1994	0.048	0.007	0.008	0.063	1.41	4.51
GERMANY	1994	0.236	0.013	-0.031	0.218	1.37	16.15
DENMARK	1994	0.012	0.001	-0.012	0.001	0.09	1.10
HONG KONG	1994	-0.101	0.029	0.001	-0.071	-1.38	5.06
FRANCE	1994	-0.061	-0.039	-0.027	-0.127	-1.63	7.68
JAPAN	1994	-0.624	0.119	0.065	-0.440	-2.56	16.71
US	1994	-0.235	-0.179	0.022	-0.392	-2.81	13.57
AUSTRIA	1994	-0.099	0.009	-0.003	-0.093	-5.00	1.77
ITALY	1994	-0.327	-0.074	-0.035	-0.436	-5.52	7.46
NL	1994	-0.408	0.006	0.001	-0.402	-9.62	3.77
POLAND	1995	0.114	0.002	-0.012	0.105	18.60	0.67
FINLAND	1995	0.079	0.095	0.003	0.177	16.64	1.24
IRELAND	1995	0.072	0.008	0.010	0.090	8.05	1.21
NL	1995	0.197	0.092	-0.005	0.284	7.51	4.06
SPAIN	1995	0.207	-0.052	-0.006	0.149	6.13	2.58
SWEDEN	1995	0.038	0.088	-0.015	0.112	5.10	2.31
CHINA	1995	0.382	-0.190	0.034	0.227	4.95	4.81
HUNGARY	1995	0.017	-0.003	0.001	0.015	4.74	0.34
ITALY	1995	0.366	-0.069	-0.040	0.257	3.44	7.72
DENMARK	1995	0.042	0.005	-0.010	0.037	3.39	1.14
FRANCE	1995	0.313	-0.081	-0.022	0.211	2.75	7.89
GERMANY	1995	0.374	0.014	0.003	0.391	2.42	16.54
AUSTRIA	1995	0.002	0.021	-0.001	0.022	1.24	1.79
BELGIUM	1995	0.014	0.021	-0.005	0.030	0.68	4.54
UK	1995	0.003	-0.002	0.004	0.005	0.07	6.68
CANADA	1995	-0.024	-0.021	-0.017	-0.062	-1.88	3.21
HONG KONG	1995	-0.122	-0.124	0.031	-0.216	-4.26	4.84
JAPAN	1995	-1.174	0.186	0.030	-0.959	-5.74	15.75
US	1995	-0.901	0.009	0.015	-0.876	-6.46	12.70
IRELAND	1996	0.119	0.033	0.021	0.174	14.34	1.38
SPAIN	1996	0.243	0.024	-0.013	0.254	9.83	2.84
POLAND	1996	0.060	-0.008	-0.003	0.049	7.28	0.72
SWEDEN	1996	0.146	0.024	-0.021	0.149	6.44	2.46
UK	1996	0.386	0.044	-0.001	0.428	6.41	7.11
ITALY	1996	0.382	0.092	0.001	0.475	6.16	8.19
US	1996	0.518	0.107	0.007	0.632	4.98	13.33
HONG KONG	1996	0.105	-0.009	-0.002	0.094	1.94	4.93
HUNGARY	1996	0.005	0.000	-0.001	0.004	1.29	0.34
CANADA	1996	0.065	-0.012	-0.019	0.033	1.03	3.24
BELGIUM	1996	0.022	-0.035	0.005	-0.008	-0.18	4.53
CHINA	1996	0.027	-0.056	0.012	-0.017	-0.36	4.79
FRANCE	1996	-0.061	0.035	-0.005	-0.031	-0.39	7.86
DENMARK	1996	-0.037	0.023	-0.002	-0.016	-1.40	1.12
FINLAND	1996	-0.017	-0.028	0.010	-0.035	-2.81	1.20
AUSTRIA	1996	-0.048	-0.002	-0.004	-0.053	-2.99	1.74
GERMANY	1996	-0.540	-0.006	0.022	-0.524	-3.17	16.02
NL	1996	-0.098	-0.040	-0.004	-0.142	-3.49	3.92
JAPAN	1996	-1.277	-0.186	-0.003	-1.467	-9.31	14.28
HUNGARY	1997	0.210	-0.001	0.008	0.217	63.27	0.56
CHINA	1997	0.737	0.051	0.026	0.814	16.98	5.60
IRELAND	1997	0.081	0.051	0.013	0.145	10.49	1.53
US	1997	0.838	0.266	-0.007	1.097	8.23	14.43
CANADA	1997	0.198	-0.022	-0.004	0.172	5.32	3.41
UK	1997	0.223	0.059	0.023	0.306	4.30	7.41
POLAND	1997	0.009	-0.011	-0.003	-0.005	-0.75	0.71
HONG KONG	1997	-0.063	0.020	0.004	-0.039	-0.80	4.89
AUSTRIA	1997	-0.002	-0.022	-0.001	-0.025	-1.41	1.71
SPAIN	1997	-0.012	-0.040	-0.007	-0.059	-2.08	2.78
FRANCE	1997	-0.224	0.019	-0.008	-0.213	-2.71	7.65
FINLAND	1997	-0.014	-0.007	-0.013	-0.034	-2.85	1.17
JAPAN	1997	-0.392	-0.013	-0.006	-0.412	-2.88	13.87
BELGIUM	1997	-0.094	-0.040	0.003	-0.131	-2.90	4.40
NL	1997	-0.133	0.014	-0.007	-0.126	-3.23	3.79
GERMANY	1997	-0.459	-0.143	0.001	-0.601	-3.75	15.42
SWEDEN	1997	-0.151	0.005	-0.003	-0.150	-6.09	2.31
DENMARK	1997	-0.097	-0.011	0.001	-0.108	-9.61	1.01

country	year	Competitiveness	Commodity mix	Interaction	Growth share	Relative growth	Share
HUNGARY	1998	0.115	0.011	0.000	0.126	22.54	0.69
IRELAND	1998	0.122	0.100	0.072	0.294	19.23	1.82
POLAND	1998	0.093	-0.019	0.003	0.077	10.80	0.79
GERMANY	1998	0.598	0.132	-0.071	0.659	4.27	16.08
US	1998	0.250	0.307	0.000	0.556	3.86	14.98
AUSTRIA	1998	0.060	0.004	-0.008	0.056	3.27	1.77
FRANCE	1998	0.126	0.186	-0.061	0.250	3.27	7.90
FINLAND	1998	0.021	0.021	-0.005	0.037	3.18	1.21
SWEDEN	1998	0.014	0.079	-0.029	0.064	2.78	2.37
SPAIN	1998	0.093	-0.002	-0.014	0.076	2.73	2.85
BELGIUM	1998	0.151	-0.018	-0.016	0.117	2.66	4.52
DENMARK	1998	0.000	0.007	-0.008	-0.002	-0.15	1.01
CANADA	1998	-0.043	0.023	0.002	-0.018	-0.52	3.39
HONG KONG	1998	0.084	-0.309	0.157	-0.069	-1.41	4.83
UK	1998	-0.183	0.036	0.035	-0.112	-1.51	7.30
CHINA	1998	0.170	-0.240	-0.019	-0.089	-1.59	5.51
ITALY	1998	0.023	-0.160	-0.023	-0.160	-2.18	7.19
NL	1998	-0.149	-0.044	-0.005	-0.198	-5.23	3.59
JAPAN	1998	-1.544	-0.114	-0.007	-1.665	-12.01	12.20
HUNGARY	1999	0.061	0.013	-0.001	0.073	10.59	0.76
CANADA	1999	0.354	-0.014	-0.004	0.336	9.89	3.73
IRELAND	1999	0.069	0.031	0.068	0.168	9.21	1.99
JAPAN	1999	0.526	0.135	0.007	0.668	5.48	12.87
CHINA	1999	0.263	-0.027	0.007	0.244	4.42	5.76
NL	1999	0.145	0.009	-0.008	0.146	4.05	3.74
DENMARK	1999	0.025	-0.003	0.014	0.037	3.64	1.05
US	1999	0.194	0.162	-0.005	0.350	2.34	15.33
AUSTRIA	1999	0.029	-0.009	-0.003	0.016	0.92	1.78
FRANCE	1999	0.031	0.002	-0.048	-0.014	-0.18	7.89
SPAIN	1999	-0.005	-0.019	-0.012	-0.036	-1.27	2.82
SWEDEN	1999	-0.060	0.024	-0.012	-0.047	-1.99	2.32
BELGIUM	1999	-0.078	-0.027	-0.007	-0.113	-2.49	4.40
GERMANY	1999	-0.344	-0.084	-0.050	-0.477	-2.97	15.60
POLAND	1999	0.006	-0.033	-0.003	-0.030	-3.84	0.76
UK	1999	-0.370	0.032	-0.010	-0.347	-4.75	6.95
ITALY	1999	-0.157	-0.168	-0.032	-0.357	-4.97	6.83
FINLAND	1999	-0.072	-0.022	0.007	-0.087	-7.20	1.12
HONG KONG	1999	-0.619	-0.002	0.091	-0.529	-10.97	4.30
CHINA	2000	1.032	0.052	0.012	1.096	19.03	6.85
POLAND	2000	0.097	-0.018	-0.003	0.076	10.00	0.83
HONG KONG	2000	0.260	0.113	0.006	0.379	8.82	4.67
JAPAN	2000	0.512	0.493	0.023	1.029	7.99	13.90
HUNGARY	2000	0.059	-0.013	0.001	0.047	6.13	0.81
US	2000	0.431	0.280	0.035	0.747	4.87	16.08
IRELAND	2000	-0.011	0.045	0.025	0.058	2.92	2.05
FINLAND	2000	-0.015	0.025	0.002	0.013	1.12	1.13
CANADA	2000	0.091	-0.136	-0.008	-0.052	-1.41	3.68
NL	2000	-0.142	-0.010	0.002	-0.151	-4.04	3.59
SWEDEN	2000	-0.121	0.028	-0.019	-0.113	-4.87	2.21
BELGIUM	2000	-0.131	-0.092	0.007	-0.216	-4.90	4.19
ITALY	2000	-0.158	-0.178	-0.016	-0.352	-5.16	6.48
SPAIN	2000	-0.043	-0.099	-0.010	-0.152	-5.39	2.67
UK	2000	-0.424	0.040	0.006	-0.378	-5.44	6.58
AUSTRIA	2000	-0.064	-0.039	-0.010	-0.113	-6.32	1.67
GERMANY	2000	-0.784	-0.285	-0.051	-1.119	-7.18	14.48
FRANCE	2000	-0.501	-0.163	-0.021	-0.685	-8.68	7.20
DENMARK	2000	-0.088	-0.045	0.020	-0.112	-10.69	0.94

Source: own calculations based on data from OECD (2002).