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Cui Bono and Why?**

**by Rolf J. Langhammer**

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## **Rising Import Demand in China: Cui Bono and Why?\***

Rolf J. Langhammer

### **Abstract:**

The paper measures income elasticities of demand for manufacturing imports in China since 1990 disaggregated by major trading partners such as the US, Japan, Germany and rest of the EU. German exporters seem to have benefited from the highest demand elasticities. The paper proposes explanatory factors such as a high degree of integration in international production chains and higher presence of foreign direct investment in China compared to partner countries responsible for the German success.

Keywords: Manufactured Imports, China Income Demand, Elasticities

JEL classification: F14

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## *I. Introduction*

Previous empirical research has found that the elasticity of real world trade to real world income rose from about 2 to more than 3 between the 1960s and 1990s (Irwin 2002). Freund (2009) and Tanaka (2009) confirmed such increase and thereby explained why trade fell so much more than GDP during the 2008/2009 economic and financial crisis. This was not only due to the fact that GDP to a large extent consists of non-tradables. The major driving force for elasticities to rise (and then to fall) sharply has been found in the slicing up of the value added chain. It has been shown that in 2008 trade in intermediate goods represented 40 percent of the non-fuel world merchandise trade (WTO 2010b). The ever rising importance of imported inputs in total output was paraphrased by Sinn (2006) as the “bazaar” effect.

As GDP is a value added term while trade is usually measured as gross output, elasticities will rise if with rising income there are more incentives to outsource stages of production. This could be driven from the supply side if rising income were associated with the rise of labour costs relative to costs of capital thus making domestic production of labour-intensive parts of the production chain less competitive relative to foreign production. But it could also be driven from the demand side, if rising income would lead to domestic capacity bottlenecks and thus would induce producers to satisfy domestic demand by shifting parts of production abroad. Consequently, with income falling in a crisis, incentives to cut cross-border value added chains grow because of declining labour costs and/or rising costs of maintaining such chains like costs of trade finance. As a result, during a crisis trade falls overproportionately.

The studies cited above have in common that they are highly aggregated and thus abstract from origin countries and destination countries as well from product specifics, such as manufactures or even more disaggregated industries such as intermediates, capital goods or consumption goods. They do not identify

different import propensities of an individual country towards partner countries. Such differences if they exist would point to a number of explanatory factors, such as endowment-driven differences in the export supply of partner countries, differences in their capacity to match their export supply with changes in the demand patterns of countries, differences in the ratios between exports supplied under perfect vs. imperfect competition, presence of foreign affiliates engaged in intra-firm trade etc, and finally, as already mentioned, differences in the importance of cross-border value added chains in exports.

The latter is of particular importance as recent attempts to measure export and imports at value added terms instead of gross output suggest that countries being exposed as export-driven such as Germany and China and other Asian countries<sup>1</sup> are more strongly integrated into such chains than countries like the US (Daudin et al. 2009) and thus report higher shares of imported inputs in their exports. Such an observation could invite two implications. First, trading partners of export-oriented countries could collect productivity gains if the export strength of the latter furthers market exit of less efficient domestic suppliers in the former country. Market exit would give room to the rise of new more efficient suppliers which could benefit more from the import demand of the export-oriented economy (Felbermayr et al. 2010). Second, with low local content and high import content, trade imbalances could not be easily reduced by exchange rate changes between two trading partners. Many more partners with different exchange rate policies would be relevant in allowing exchange rates to change trade balances (WTO 2010a).

This paper will concentrate on the export performance of major trading partners in one of the most rapidly growing emerging markets. High GDP growth in

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<sup>1</sup> Cross-border value added chains have been extensively analysed in studies of Athukorala (2010), Kim et al. (2010), Arora and Vamvakidis (2010) and Park and Shin (2009).

China has coincided with rapid growth of Chinese imports which by no means was limited to primary commodities. In fact, between 2000 and 2008 China's share in world manufactured imports almost doubled from 3.5 per cent to 6.8 percent.

Against this background, the paper focuses on the question whether and if so why different trading partners of China were facing different income elasticities of demand for their manufactured products on the Chinese markets. For that purpose, income elasticities of manufactured import demand of China<sup>2</sup> vis-à-vis different partner countries including the major industrialized countries are measured over a moving 10-year moving average since 1990 (for traditional SITC categories) and over a 5-year moving average for Broad Economic Categories (BEC) categories<sup>3</sup> (Section II). The latter categories help to disaggregate between intermediates, capital goods and consumption goods.

In Section III the paper formulates three hypotheses to explain why partner countries of China face different import demand elasticities and why such reasons are more likely to be supply-induced rather than demand-induced. Section IV concludes.

## *II. Income elasticities of import demand for manufactures in China. Similarities and differences among partner countries.*

Two series of income elasticities are calculated. For the SITC categories, figures 1-5 show the elasticities for total manufactures (SITC 5-8), chemicals (SITC 5), material-based manufactured goods (SITC 6), machinery and transport equipment (SITC 7), and miscellaneous manufactured articles (SITC 8). For

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<sup>2</sup> These elasticities are simply measured by double-log regression between the average annual growth rates of real Chinese GDP (exogenous variable) and the average annual growth rates of Chinese real manufactured imports from different partner countries over different periods (with the average of the manufactured export price indices of Germany, Japan and the US 1990-2008, 2000=100 used as the deflator). Data sources of Figures 1-8 are: World Bank, World Development Indicators, UN Commodity Trade Statistics; World Trade Organization, International Trade Statistics, annual.

<sup>3</sup> Lack of data availability restricts measurement of elasticities to a moving five year average for BEC categories

BEC categories, figures 6-8 show elasticities for industrial supplies, basically intermediates capital goods, and consumption goods<sup>4</sup>.

Partner countries and areas are, the US, Japan, Germany, and the EU-15 countries excluding Germany. The latter distinction is motivated by the strength of German manufacturers on world markets relative to EU partner countries.

The following results merit attention

- Chinese income elasticities of demand for total manufactured imports peaked around year 2000 at about 2.2 (Figure 1). Before 2000, they had consistently risen from less than 1.5 and after 2000 fell partly due to the 2008/2009 trade collapse as a result of the crisis. Yet, the fall did not reach the initial level, except for one partner country, the US. This cyclical pattern replicates in the specific sectors.
- Peaks in import demand have not been fully synchronised over manufacturing industries. For chemicals, the peak came earlier (end of 1990s) than for other sectors. For machinery and transport equipment, the peak came later. Given that chemicals contains more upstream products than the more downstream machinery products, this import sequence may reflect two different driving forces. First, the sequence could have been driven by distinctive Chinese consumption patterns following the rise of income (intermediate goods first, finished goods later). Second, it could reflect the sequence of building production capacities in China with an early focus on capital goods followed by the establishment of finished goods capacities.
- Relative to partner countries, German exports to China emerge as most successful in matching Chinese demand while the exports from the US to China had not only to accept the lowest elasticities among the partner

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<sup>4</sup> Tables for the numerical elasticities are available upon request.

countries but also failed to benefit from cyclical upswings. Instead, elasticities against US goods remained mostly flat and low. Except for finished consumer and capital goods, such pattern also holds for specific manufacturing sectors. Other Chinese trading partners including other EU member states range between the two poles.

- Differentiating between intermediates, capital goods and consumer goods (Figures 6-8), confirms the year 2000 peak, the leading position of Germany, and the tail light position of the US. Due to using a five-year moving average instead of 10-year average, the slump after year 2000 is more distinct.
- Consumer goods enjoyed the highest income elasticity over the entire period relative to intermediates and capital goods with Germany ranking first in absolute level (about 4 by year 2000). The slump in elasticities after year 2000 is matched by all partner countries.

### *III. Explaining Germany's export performance vs. US performance: Some hypotheses*

The estimates provoke the question: what is special with Germany and its excellent position on the Chinese market both in consumer and capital goods? Except for some finished goods, Germany always seemed to have triggered more demand in China for its exports than partner countries.

Here are three hypotheses with comparative data for Germany and the US as the two trading partners with most different performances in China:

#### Made by German firms not by Germany

Exports to partner countries do not entirely include “originating” inputs. Inputs are imported and processed for exports. In general, trade in intermediate goods

has risen much faster than trade in finished goods but the degree to which countries are part of cross-border value added chains is very uneven. Recent German foreign trade statistics for 2009 report the share of imported inputs in German exports to almost one fifth (18.7 per cent: Statistisches Bundesamt, 2010). Earlier estimates from the GTAP 6 database (Daudin et al. 2009: Table 7) quote an even higher import content in German exports of 23 per cent. In contrast, the import content in US (total) exports is reported to be only 14 per cent. In fact, the GTAP database reveals the import content in US exports to be among the lowest of all industrialized countries. Even if non-manufacturing US exports, for instance, agriculture, which are included in the GTAP data might have higher local content shares than manufacturing, it seems that the US exporters in general seem less integrated into global sourcing than their German counterparts. This could be a competitive disadvantage given the efficiency raising effects of global supply chains. Measuring trade at value added terms could shed more light on the importance of global sourcing (WTO 2010b; Maurer, Degain 2010).

### More German than US Foreign Direct Investment (FDI) in China

Regardless of whether FDI is horizontal (domestic market-oriented) or vertical (cost-oriented), it helps to anchor products, brands, and technology of the home country in host country's consumer preferences and technology chains, to mitigate protectionist threats in the host country (so-called quid-pro-quo investment), and to pave the ground for direct exports from the home country. In this respect, empirical evidence clearly suggests FDI to be complementary rather than substitutive to direct exports.

In terms of sheer size, German FDI in China's manufacturing sector is still far behind FDI in neighbouring EU countries, but the speed of change has been



impressive. While in 1998 only 2.1 per cent of total German FDI stock in manufacturing were in China (3.2 per cent and 2.9 per cent for total German FDI in machinery and automobile production, respectively), these shares had more than doubled within ten years. In 2008, these shares were at 5.2 percent, 10.1 per cent and 6.7 per cent, respectively (Deutsche Bundesbank 2010, 2000).

The corresponding figures for US FDI in Chinese manufacturing for the same period reveal lower starting levels and lower end-period levels: while China hosted 1.2 per cent, 1.3 per cent and 0.1 per cent of total US FDI in manufacturing, machinery and transportation equipment in 1998, ten years later these shares (while rising) were not higher than 4.7 per cent, 3.7 per cent and 4.4 per cent, respectively (US Department of Commerce, 2010, 2000).

Thus, not only did German investors penetrate the Chinese market earlier than US investors, they have also focused more on China than US firms relative to other host countries, in particular in their “champion” industries such as machinery and transport.

#### *Exchange rate advantages of EU suppliers against dollar-bloc suppliers*

Price competitiveness is a key factor in determining gains or losses of trading partners on the Chinese markets. It is the more important the more products are supplied under perfect competition and constant returns to scale and the less important the more suppliers can benefit from brand reputation, product differentiation, consumer preferences and increasing returns to scale. In general, exchange rate changes between the US \$ and the European currencies and the Euro, respectively, are relevant indicators for changes in competitiveness as the Chinese currency was either completely or virtually fixed to the Dollar throughout the whole period.

Collignon (2010) measuring elasticities of Chinese imports from Europe as a function of exchange rate changes and changes in economic growth concludes that imports responded more strongly to changes in economic growth than to

changes in the nominal exchange rate between Yuan and Euro. A 10 per cent increase in China's growth rate would raise Europe's exports to China by more than 28 per cent while a 10 per cent appreciation of the Euro against the Yuan would lower exports by only 6.7 per cent. (ibid:48).

This suggests price effects to be lower than growth effects, probably because of European sophisticated products being more supplied under imperfect than perfect competition. As concerns the competitiveness against dollar-bloc suppliers, European suppliers should have benefited from a depreciation trend of the European currencies against a dollar between mid 1990s and early 2000 and should have suffered from appreciation of the euro after 2000. However, it is far from clear from the estimates whether the latter exchange rate movement has helped the US export sector. While income elasticities for European products declined they remained flat for the USA.

#### *IV. Concluding remarks*

The paper confirms the striking success of German manufacturing products on the Chinese market relative to the export performance of competing foreign suppliers. It is remarkable that this success emerged throughout the entire period under observation (since 1990) though in recent years Germany suffered from the same decline of import demand triggered by the economic crisis as the partner countries. It is furthermore worth mentioning that German success seems less owed to price competitiveness but to swift adjustment to Chinese rising demand for consumer and capital products offered under imperfect competition. Hypotheses to explain German success should focus on the strong link between German FDI presence in China and direct exports from Germany and the degree of using the productivity gains from cross-border value added chains. The latter should mitigate concerns in partner countries about an overly strong export orientation in German manufacturing. It is this export orientation which is

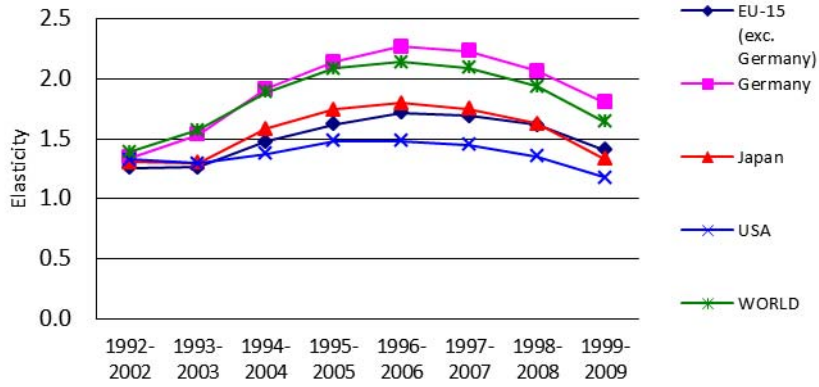
instrumental to let suppliers from many countries participate in German export success, collect productivity gains and thus let their exports grow too.

## Bibliography

- Arora, Vivek, Athanasios Vamvakidis (2010), China's Economic Growth: International Spillovers. International Monetary Fund, Working Paper WP 10/165. July, Washington D.C.
- Athukorala, Prema-chandra (2010), Production Networks and Trade Patterns in East Asia: Regionalization or Globalization?, Asian Development Bank Working Paper Series on Regional Economic Integration, No. 56, August, Manila.
- Collignon, Stefan (2010), Rebalancing the Global Economy: A Case for International Monetary Cooperation. In: Stefan Collignon, Richard. N. Cooper, Masahiro Kawai, Yongjun Zhang, Rebalancing the Global Economy. Four Perspectives on the Future of the International Monetary System. Europe in Dialogue 2010/01, Guetersloh: Bertelsmann Stiftung: 17-52.
- Daudin, Guillaume, Christine Riffart, Danielle Schweisguth (2009), Who Produces for Whom in the World Economy? Observatoire Francais des Conjunctures Economicques, Document de Travail, no. 2009-18, Paris, Juillet.
- Deutsche Bundesbank, Bestandserhebung über Direktinvestitionen, Statistische Sonderveröffentlichung 10, May 2000 and April 2010, Frankfurt [http://www.bundesbank.de/download/statistik/stat\\_sonder/statso10.pdf](http://www.bundesbank.de/download/statistik/stat_sonder/statso10.pdf)
- Felbermayr, Gabriel, Langhammer, Rolf J., Larch, Mario, Lechthaler, Wolfgang (2010) Deutsche Lohnzurückhaltung Hilft den Nachbarn, Ökonomenstimme, 30. Juni, Zürich. <http://www.oekonomenstimme.org/artikel/2010/06/deutsche-lohnzurueckhaltung-hilft-den-nachbarn/>
- Freund, Caroline (2009), Demystifying the Collapse in Trade. VoxOrg, Centre of Economic Policy Research (CEPR) London: July 3,2009. <http://www.voxeu.org/index.-php?q=node/3731>
- Irwin, Douglas (2002), Long-Run Trends in World Trade and Income, *World Trade Review*, 1:1:89-100.
- Kim, Soyoun, Jong-Wha Lee, Cyn-Young Park (2010), The Ties that Bind Asia, Europe and the United States. Asian Development Bank, No. 192, February, Manila.
- Maurer, Andreas, Christophe Degain (2010), Globalization and Trade Flows: What You See is Not What You Get, World Trade Organization , Economic Research and Statistics Division, Staff Working Paper ERSD-2010-12, June, Geneva, mimeo.
- Park, Donghyun, Kwanho Shin (2009), Can Trade with the People's Republic of China be an Engine of Growth for Developing Asia?, Asian Development Bank Economics Working Paper Series, No. 172, October, Manila.
- Sinn, Hans-Werner (2006), The Pathological Export Boom and the Bazaar Effect: How to Solve the German Puzzle. *The World Economy*, 29:9: 1157-1175.

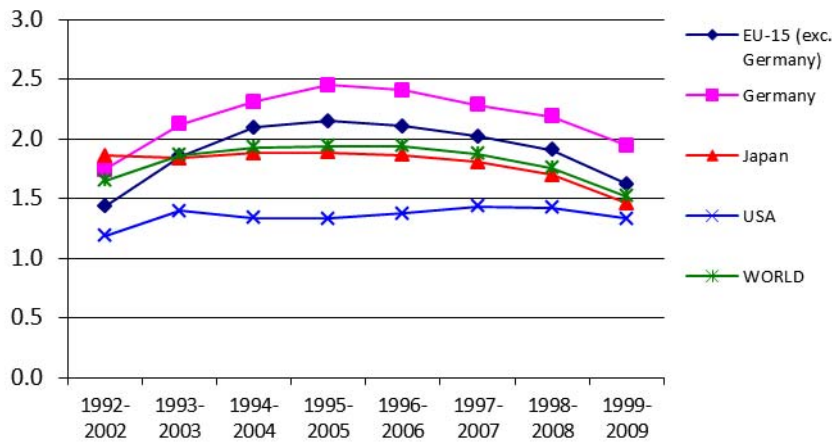
- Statistisches Bundesamt (2010), „Fast ein Fünftel der deutschen Exportgüter stammen aus dem Ausland“, Pressemitteilung 032 of 10.8.2010, Wiesbaden [http://www.destatis.de/jetspeed/portal/cms/Sites/destatis/Internet/DE/Presse/pm/zdw/2010/PD10\\_032\\_p002,templateId=renderPrint.psml](http://www.destatis.de/jetspeed/portal/cms/Sites/destatis/Internet/DE/Presse/pm/zdw/2010/PD10_032_p002,templateId=renderPrint.psml)
- Tanaka, Kiyoyasu (2009), Trade Collapse and International Supply Chains: Japanese Evidence, VoxOrg, Centre of Economic Policy Research (CEPR) London: November 27 2009. <http://www.voxeu.org/index.php?q=node/4284>
- U.S. Department of Commerce (2010, 2000), Survey of Current Business, U.S. Direct Investment Position Abroad on a Historical-Cost Basis, Washington. [http://www.bea.gov/international/xls/pos\\_long\\_09.xls](http://www.bea.gov/international/xls/pos_long_09.xls)
- WTO (2010a), DDG Jara Urges Another Way of Looking at Trade Statistics, WTO News Items, May 26 and 28, [http://www.wto.org/english/news\\_e/news10\\_e/devel\\_26may10\\_e.htm](http://www.wto.org/english/news_e/news10_e/devel_26may10_e.htm)
- WTO (2010b), Measuring International Trade in Value Added: An Introduction. WTO Document 30/4/2010, Geneva, mimeo.

**Figure 1: 10 YEAR PERIOD REGRESSION  
Total Manufactures (SITC 5 - 8)**

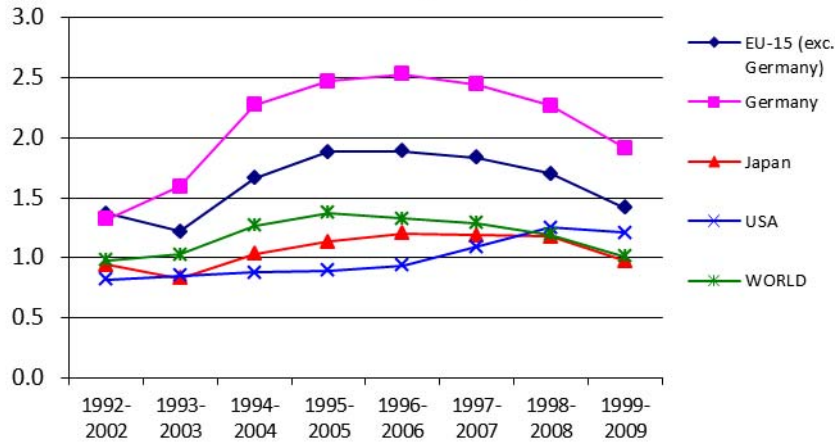


Regression:  $\ln(x_t) = \beta_0 + \beta_1 \ln(y_t) + \varepsilon_t$ , where  $\beta_1$  is the import demand elasticity of China;  
 $x_t$  = real imports in periode t;  $y_t$  = real GDP in period t

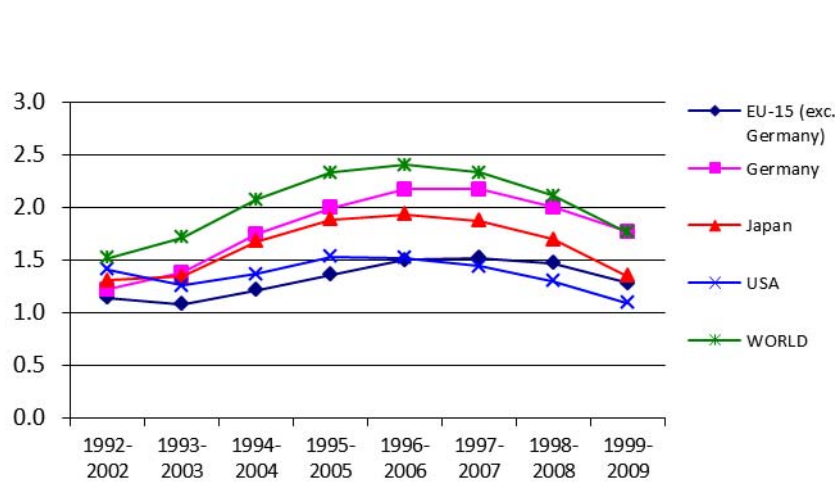
**Figure 2: 10 YEAR PERIOD REGRESSION  
Chemicals (SITC 5)**



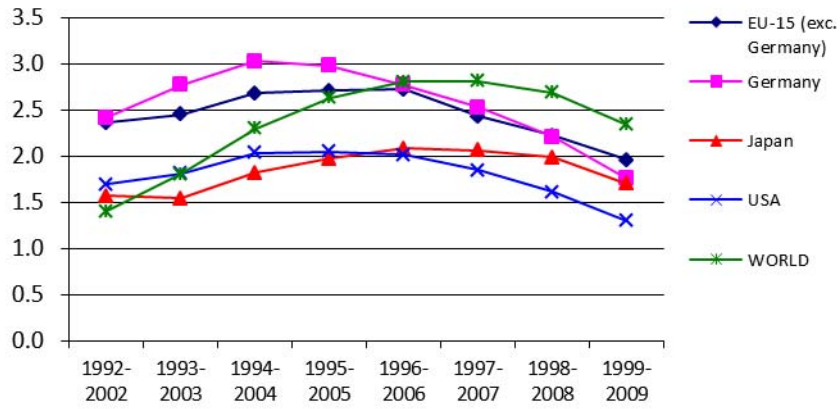
**Figure 3: 10 YEAR PERIOD REGRESSION  
Manufactured goods classified chiefly by  
material (SITC 6)**



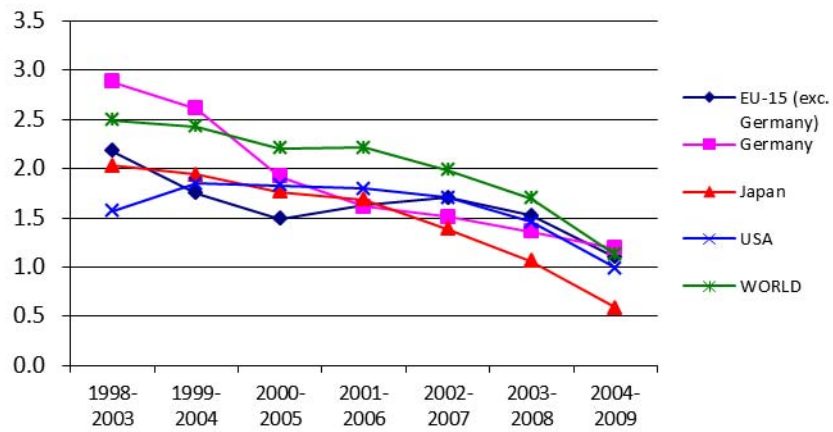
**Figure 4: 10 YEAR PERIOD REGRESSION  
Machinery and transport equipment (SITC 7)**



**Figure 5: 10 YEAR PERIOD REGRESSION  
Miscellaneous manufactured articles (SITC  
8)**



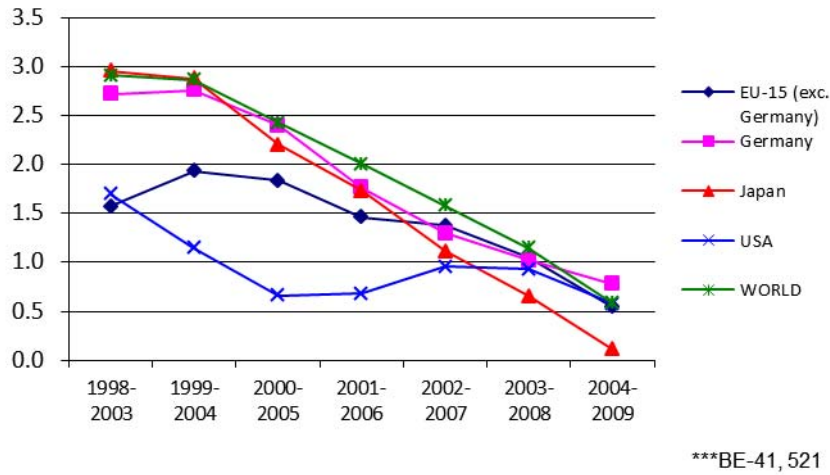
**Figure 6: 5 YEAR PERIOD REGRESSION  
Industrial Supplies\***



\*BE-111, 121, 2, 31, 322, 42,



**Figure 7: 5 YEAR PERIOD REGRESSION  
Capital Goods\*\*\***



**Figure 8: 5 YEAR PERIOD REGRESSION  
Consumption Goods\*\***

