



## Workshop on measurement of e-commerce and external trade indicators

Dubai-UAE, 30 March - 1 April 2009

### Session IV: EXTERNAL TRADE INDICATORS

#### a) OECDs Economic Globalisation Indicators: the trade chapter

External trade is one of the most important and visible elements of economic transactions in a globalised world. As part of economic globalisation, it constitutes a recurrent – and relevant – element in OECD's well known "Economic Globalisation Indicators (EGI)". These indicators are used world-wide for economic analysis and the sound underlying methodology (laid down in the "Handbook on Economic Globalisation Indicators" in 2005) is considered as a kind of international "gold standard".

The OECD is currently working on the 2<sup>nd</sup> edition of its "Economic Globalisation Indicators". This 2<sup>nd</sup> edition, initially scheduled for end 2008, had to be postponed to 2009 to include a new chapter on the principal components of international transactions to address key issues of the current financial crisis turmoil. In comparison to the 1<sup>st</sup> edition of 2005, this edition contains also other new chapters and indicators, notably on migration and environmental aspects of globalisation. The Statistics Directorate provides significantly contributes to the 4<sup>th</sup> chapter, "Aspects of trade globalisation", the draft version of its first sub-chapter is given below. As can be seen, the indicators shown are presented using a common framework of presentation to facilitate understanding and comparisons across indicators.

To put the trade chapter into the EGI 2009 context, the following is the rough outline of the forthcoming publication, planned to be published around September 2009:

- I. Principal Components of International Transactions (based upon BoP and FDI)
- II. Economic Activity of Multinationals
- III. Internationalisation of Technology
- IV. *Aspects of Trade Globalisation*
  - ***International trade in goods and trade in services (see detail below)***
  - *Intra-regional trade*

- *International trade of multinationals*
- *Trade linked to off-shoring and sub-contracting abroad*
- V. International Migration
- VI. Aspects of environmental globalisation

Next steps:

- All indicators will be updated, using the latest available data
- Additional indicators may be added, following consultations
- The 2<sup>nd</sup> EGI edition will be published in 2009

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## INTRODUCTION (TRADE CHAPTER OF EGI)

1. OECDs first Economic Globalisation Indicators (EGI) publication and the underlying methodological guidelines (Handbook on Economic Globalisation Indicators, HEGI), both published in 2005, were a world-wide success, establishing for the first time a framework, measurement guidelines and a set of indicators.

2. In continuation and extension of this organisation-wide effort, the second edition is planned to be published by end 2008. This document provides WPTGS delegates with the trade chapter of the forthcoming EGI publication. It is, of course, still to be considered as a draft. But delegates will get a precise idea about the indicators selected and the way they will be published. A more general overview across chapters will be given orally by Mr. Thomas Hatzichronoglou, who –again- is the coordinator and editor.

3. The EGI 2008 trade chapter is organised as follows: Starting with the countries' degree and evolution of integration into the world economy (trade as a percentage of GDP), it then compares how flows, imports and exports, evolved over time, leading to surpluses or deficits (trade balance as a percentage of GDP). Thanks to the systematic addition of BIICS<sup>1</sup> and OECD accession countries<sup>2</sup> to OECD countries, world-wide growth and shift patterns are shown. World export market shares, one indicator of competitiveness, are shown next (world export market shares). The figures reveal a telling story on global winners (in particular China) and losers (United States and some other OECD economies) in the globally competing and connected world economies.

4. Given the –again- very different trends and patterns between traded goods and services, a separate analysis is shown also for each category. Particular attention is paid in this analysis to the geographical distribution shifts for the EU25, United States, Japan, India, China (including Hong Kong, China) and Asia. After the look at export performance, the opposite flows, namely import penetration, are analysed. The indicators shed some light on the degree of competitive pressure in domestic markets, quite revealing in particular for smaller economies. This analysis is completed by a more detailed look at trade balances of main aggregates (OECD, EU15) and main OECD traders (United States and Japan) with China and the rest of the World countries. Intra-industry trade indices, albeit beset with methodological complications, allow a closer look at the international division of production processes and economic integration by identifying trade in intermediate goods and finished products.

5. The analysis of trade in High-Tech products is an important element of merchandise trade and complements the sectoral approach by allowing a more detailed analysis of trade and competitiveness. Trends are shown, including complete summaries for main traders. Lastly, the sensitivity of trade flows to price and income changes is analysed, showing mostly negative and inelastic price elasticities and sensitivity to income for OECD countries.

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<sup>1</sup> Brazil, India, Indonesia, China, and South Africa

<sup>2</sup> Chile, Estonia, Israel, Russian Federation, and Slovenia

International trade in goods and services reflects countries' integration into the world economy. In relation to their GDP, small countries are generally more integrated. They tend to specialise in a limited number of sectors, and, in order to satisfy domestic demand, they need to import and export more goods and services than larger countries. Size alone, however, does not determine the level of trade integration into the world economy (Figure I.1.1).

The ratio of exports and imports to GDP, in current prices, increased between 2000 and 2006 in 23 out of 30 OECD countries. The largest increases within OECD countries were observed for the Slovak Republic (+33 percentage points) and Luxembourg (+24 percentage points), while Ireland's (-34 percentage points) and Canada's (-15 percentage points) trade-to-GDP-ratios decreased most. Luxembourg remained the OECD member country with the highest trade-to-GDP ratio with 303% in 2006, due to financial services. The OECD countries with the lowest ratios remained the United States (28% in 2006) and Japan (31%) which is also due to the fact that, in general, larger economies depend less on external markets to satisfy their domestic demand. As illustration, Estonia, a very small economy, has the highest import penetration rate of all OECD Accession countries (see section I.6.).

Within the five OECD Accession Countries (Russian Federation, Slovenia, Estonia, Israel and Chile), the highest trade-to-GDP-ratio (for both goods and services) in 2006 was measured for Estonia with a percentage of 176% (+1 percentage point), while the accession country with the lowest ratio was the Russian Federation (55%; -13 percentage points against 2000). Estonia's high degree of economic integration into international markets is mainly due to three factors: the accession to the European Union, relatively liberal customs policies and its

significant role in the provision of energy for the region.

Regarding the countries of the Enhanced Engagement Program (EEP) of the OECD (China, India, Brazil, Indonesia and South Africa), China and India showed the most marked increases in trade-to-GDP ratio. China's ratio increased from 44% in 2000 to 74% in 2006 and India's ratio from 27% (2000) to 49% (2006).

Traditionally, international trade in goods has been the principal channel for economic integration. Over the past two decades, however, other forms of transactions have become increasingly dominant (e.g. foreign direct investment, portfolio investment) due to the implementation of global strategies by firms and the liberalisation of capital movements.

In 2006, the OECD average of the trade-to-GDP ratio of goods in the OECD area was 67%, up from 64% in 2000, an increase similar to that for total trade (+5 percentage points). The highest ratio in 2006 was measured for the Slovak Republic (157%), while this had been the case for Ireland in 2000 (2000: 127%, 2006: 81%). This development is also reflected in the import penetration rates for goods of both countries (see section I.6.).

As a share of GDP in 2006, trade in services in the OECD area only accounted for around 25% of GDP. The relatively minor role of services in international trade is in contrast to the contribution of services in the domestic economies of member countries, where the proportion of total value added is around 70% and rising. Luxembourg and Ireland had the highest values in terms of share of GDP (as in 2000). In Luxembourg, financial services played a dominant role in exports, and in Ireland, technology payments were a very important component of total imports.

#### Source

- Database: OECD Trade Indicators, May 2008.
- For non-OECD countries:: UNSD National Accounts Main Aggregates Database, May 2008.

#### Websites

- OECD Trade Indicators, [www.oecd.org/std/its/tradeindicators](http://www.oecd.org/std/its/tradeindicators).
- UNSD National Accounts Main Aggregates Database, [unstats.un.org/unsd/snaama](http://unstats.un.org/unsd/snaama).

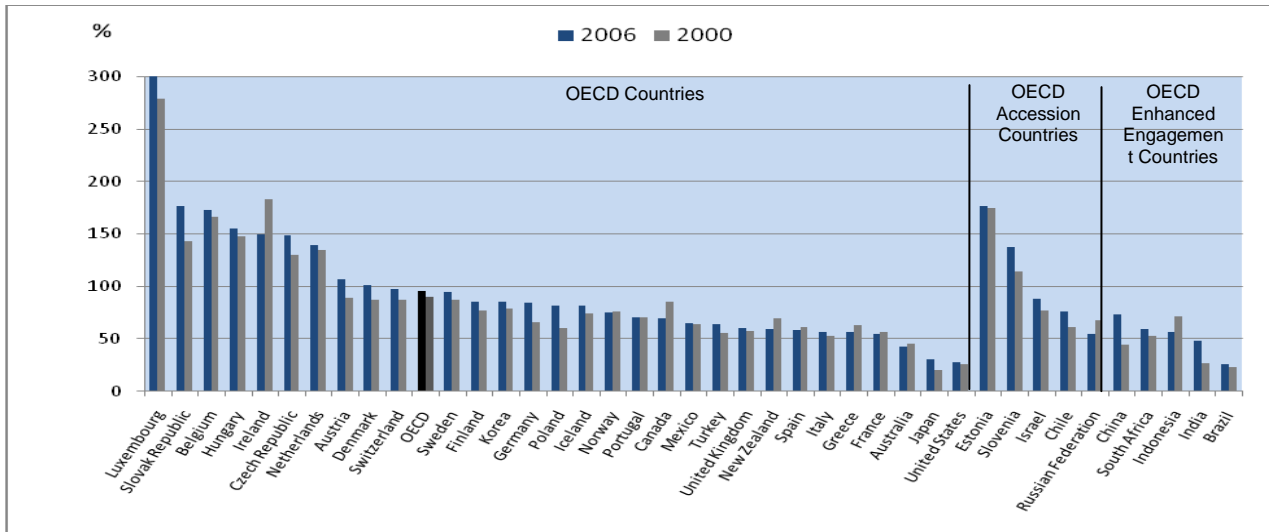
#### Box 1. Trade-to-GDP-ratio

The most frequently used indicator of the importance of international transactions relative to domestic wealth creation is the trade-to-GDP ratio, which is the sum of exports and imports of goods and services in GDP.

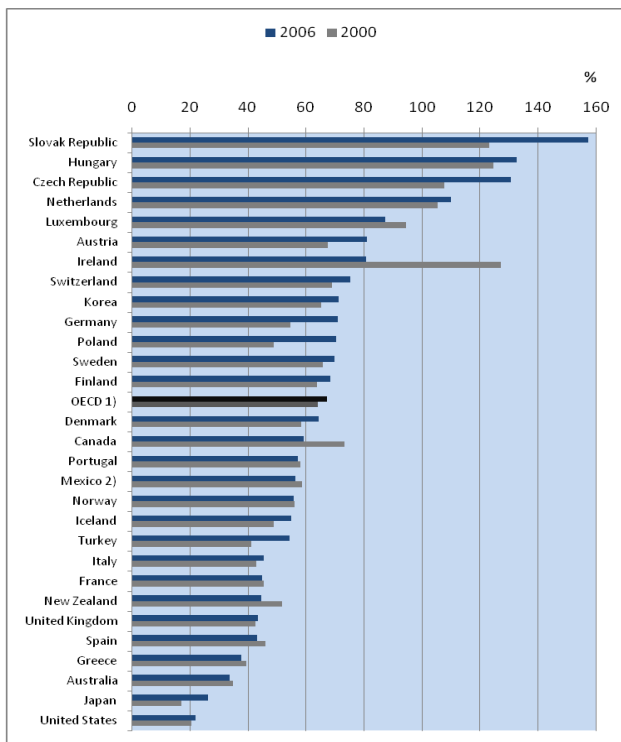
International trade tends to be more important for countries that are small (in terms of size or population) and surrounded by neighbouring countries with open trade regimes than for large, relatively self-sufficient countries or those that are geographically isolated and thus penalised by high transport costs. Other factors also help explain differences in trade-to-GDP ratios across countries, such as history, culture, (trade) policy, the structure of the economy (especially the weight of non-tradable services in GDP), re-exports and the presence of multinational firms (intra-firm trade).

The trade-to-GDP ratio is often called the trade openness ratio. However, the term “openness” to international competition may be somewhat misleading. In fact, a low ratio does not necessarily imply high (tariff or non-tariff) obstacles to foreign trade, but may be due to the factors mentioned above, especially size and geographic remoteness from potential trading partners.

**Figure I.1.1. Sum of exports and imports, goods and services, as a percentage of GDP**  
Per cent, current prices

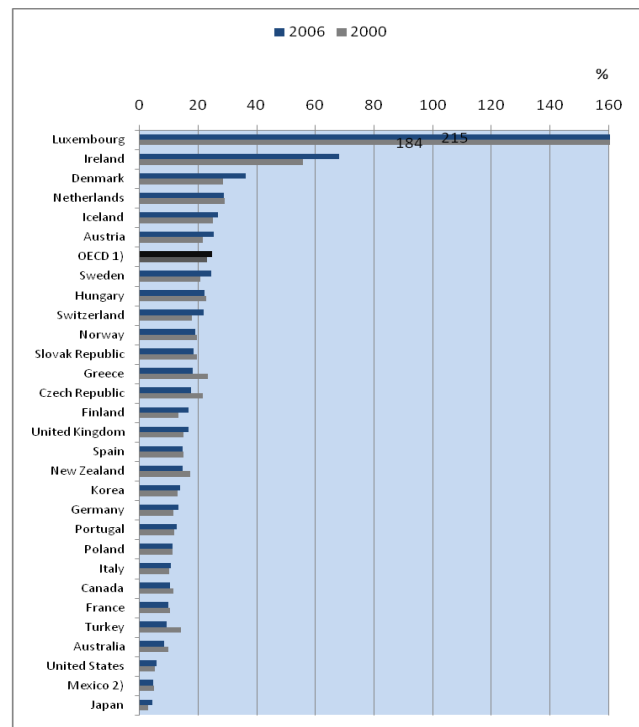


**Figure I.1.2. Goods exports and imports as a percentage of GDP**  
Per cent, current prices



1. Figures for Belgium not available, average figure for OECD relates to OECD without this country.
2. Data for Mexico not available for 2006, figure refers to 2004.

**Figure I.1.2. Services exports and imports as a percentage of GDP**  
Per cent, current prices



1. Figures for Belgium not available, average figure for OECD relates to OECD without this country.
2. Data for Mexico not available for 2006, figure refers to 2004.

Figure I.2.1a. illustrates the changes in the trade balance of goods and services as a percentage of GDP in 2000 and 2006 in current prices, for OECD countries, figure I.2.b. for OECD accession countries and countries of the Enhanced Engagement Program (EEP). These changes show that some countries are in both years in surplus or in deficit, while these surpluses or deficits deteriorate, improve or remain stable. International trade in goods and services reflects countries' integration into the world economy.

These changes could be summarised as follows:

- ❖ Increase of surplus: Luxembourg, Norway, Sweden, Switzerland, Netherlands, Austria and Germany. Accession Countries/EEP: Chile and China.
- ❖ Stable surplus: Belgium, Japan, OECD average.
- ❖ Decrease of surplus: Ireland, Finland, Denmark, Canada and Korea. Accession countries/EEP: Russian Federation and Indonesia.
- ❖ From surplus to deficit: Italy, Australia, New Zealand, France. Accession countries/EEP: South Africa.
- ❖ From deficit to surplus: Hungary, Czech Republic. Accession countries/EEP: Israel and Brazil.
- ❖ Decrease of deficit: Mexico, Poland, Portugal and Greece. Accession countries/EEP: Slovenia.
- ❖ Deterioration of deficit: Iceland, Turkey, Spain, United States and United Kingdom. Accession countries/EEP: India and Estonia.

The changes are due first to different export and import trends (Figure I.2.2). In some countries, the trade balance improved because of higher growth exports (e.g. Czech Republic, Slovak Republic and China). In others, the trade balance deteriorated because of the sharp rise in imports (e.g. the United States). In some countries where the balance registered deterioration, exports and imports expanded at the same pace but because of an export/import ratio significantly lower than 1, deficits widened (e.g. Estonia, India and Russian Federation).

For merchandise trade (see figure I.2.3.), Norway and Ireland had the highest ratios with 16.9% in 2006 for Norway and 14.5% for Ireland. The highest negative ratios were observed for Greece (-18.8%) and Iceland (-13.4%). For both Greece and Iceland, this was mainly due to a large trade deficit in machinery and transport equipment.

Figure I.2.4. illustrates the situation for trade in services. It is obvious that the sequence of countries is not the same as for merchandise trade, showing different trade focuses by country. In 2006, Luxembourg had the highest trade-balance-to-GDP ratio with a value of 39.4% (2000: 33.5%), followed by Switzerland with 6.5% (2000: 6.8%), while the highest negative values were observed for Iceland (-4.6% in 2006) and Ireland (-3.8% in 2006).

#### Source

- Database: Database: OECD Trade Indicators, May 2008.
- Non-OECD countries: UNSD National Accounts Main Aggregates Database, May 2008.

#### Websites

- OECD Trade Indicators, [www.oecd.org/std/its/tradeindicators](http://www.oecd.org/std/its/tradeindicators)
- UNSD National Accounts Main Aggregates Database, [unstats.un.org/unsd/snaama](http://unstats.un.org/unsd/snaama).

## Box 2. Trade balance, export-import-ratio and international competitiveness

The trade balance (exports less imports) is probably the macro-economic indicator that is most frequently used to gauge the competitiveness of a country or of a sector or product at national level. The export-import ratio (exports to imports) is also used but the two measurements are not alternatives, rather they are complementary given that one can improve and the other deteriorate at the same time, and vice-versa.

The interpretation of trade balances needs to take account of the factors which influence it. The most important could be:

### 1. *Improvement of price-competitiveness and structural competitiveness*

The main question here is to what extent an improved trade balance or import-export ratio may be attributable to improved competitiveness or other factors. An improvement in relative prices can contribute to trade surpluses but this will also depend on the factors responsible. If, for example, the improvement is the outcome of more efficient control of production costs or an improvement in non-price factors (structural competitiveness) such as innovation, product quality, etc., then this result does reflect improved competitiveness. The factors mentioned below, on the other hand, can help improve the trade balance but are unrelated to competitiveness.

### 2. *Cyclical lag*

Box 3. When export market demand grows more rapidly than a country's domestic demand, the trade balance will tend to improve as long as there are no other obstacles preventing export growth (e.g. a lack of spare capacity). In the same way, if domestic demand grows faster than export markets, other things being equal, the trade balance will tend to deteriorate. However, a permanently excessive domestic consumption could be due to structural causes, mainly an imbalance between savings and investment.

### 3. *Terms of trade*

If the price of imported goods were to rise more slowly than that of exported goods, or if the import price of certain primary commodities were to decline (oil, raw material, food, etc.), the trade balance would improve without the country's competitiveness being in any way responsible for the improvement.

### 4. *Other factors*

The introduction of structural adjustment policies made necessary as a result of excessive government borrowing, for example, may be intended to increase exports and massively cut imports. The factors mentioned above are not exhaustive (see also Box 1.3), but are among those which should be given prime consideration when analysing the influence of competitiveness on the trade balance.

In the framework of this document, only the main results are presented without analysing the causes and the links between the trade balance trends and competitiveness. The most frequently used indicator of the importance of international transactions relative to domestic transactions is the trade-to-GDP ratio, which is the sum of exports and imports of goods and services in GDP.

International trade tends to be more important for countries that are small (in terms of size or population) and surrounded by neighbouring countries with open trade regimes than for large, relatively self-sufficient countries or those that are geographically isolated and thus penalised by high transport costs. Other factors also help explain differences in trade-to-GDP ratios across countries, such as history, culture, (trade) policy, the structure of the economy (especially the weight of non-tradable services in GDP), re-exports and the presence of multinational firms (intra-firm trade).

The trade-to-GDP ratio is often called the trade openness ratio. However, the term "openness" to international competition may be somewhat misleading. In fact, a low ratio does not necessarily imply high (tariff or non-tariff) obstacles to foreign trade, but may be due to the factors mentioned above, especially size and geographic remoteness from potential trading partners. .



## TRADE BALANCE AS A PERCENTAGE OF GDP

I.2.

Figure I.2.1a. Trade balance in goods and services as a percentage of GDP of OECD countries, in 2000 and 2006

Per cent, current prices

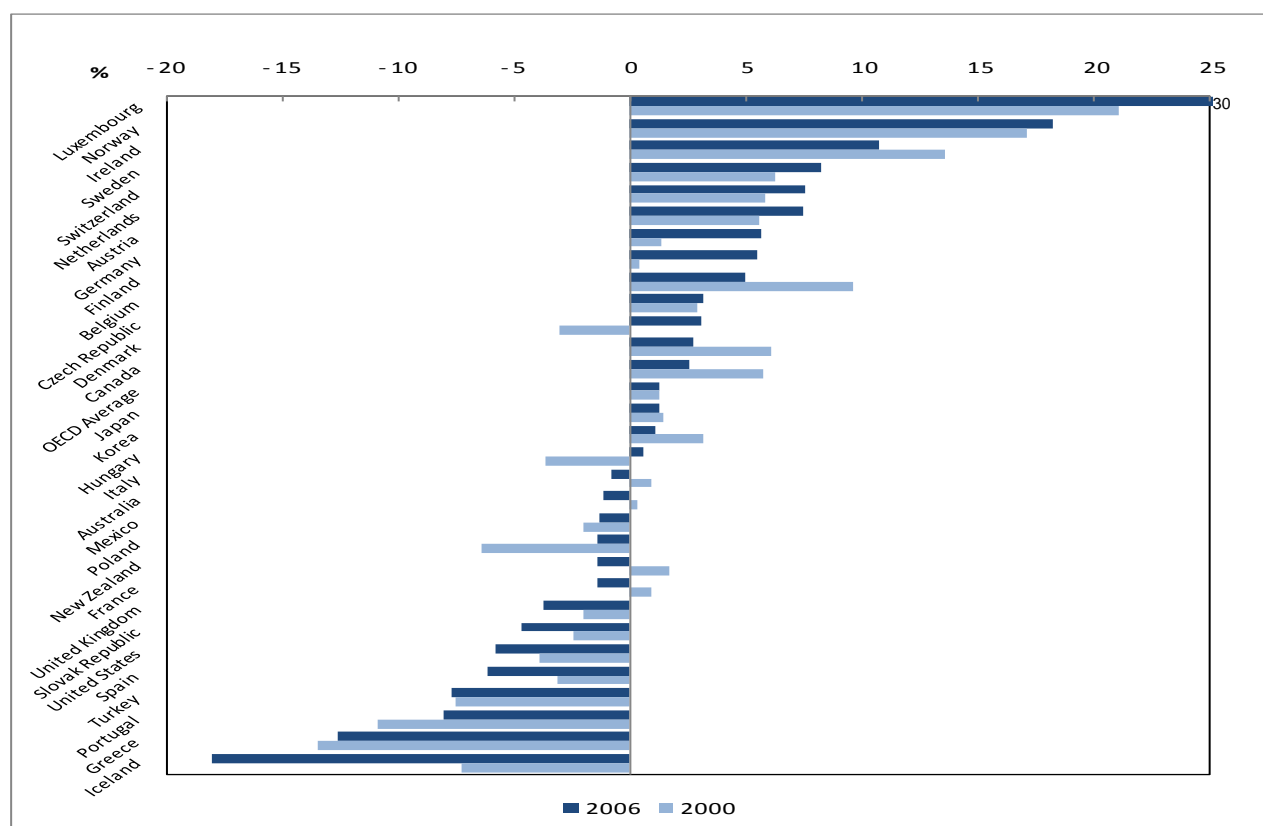
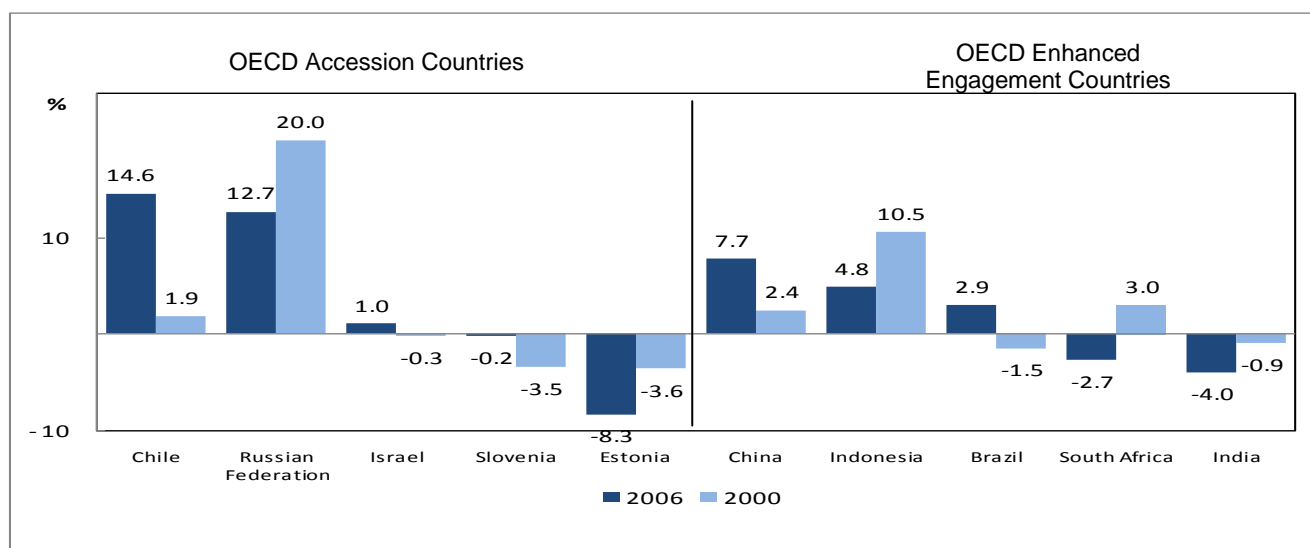
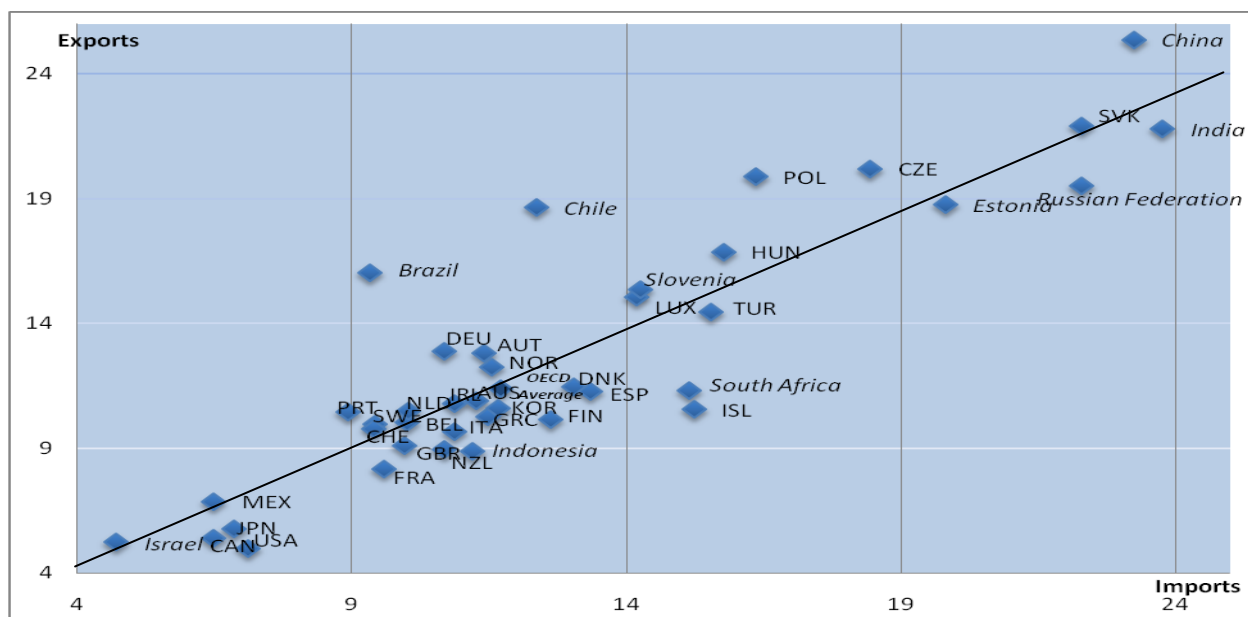


Figure I.2.1b. Trade balance in goods and services as a percentage of GDP of OECD Accession / Enhanced Engagement Program Countries, in 2000 and 2006

Per cent, current prices



**Figure I.2.2. Trade in goods and services**  
Average annual growth rate, 2000-2006 (current prices)

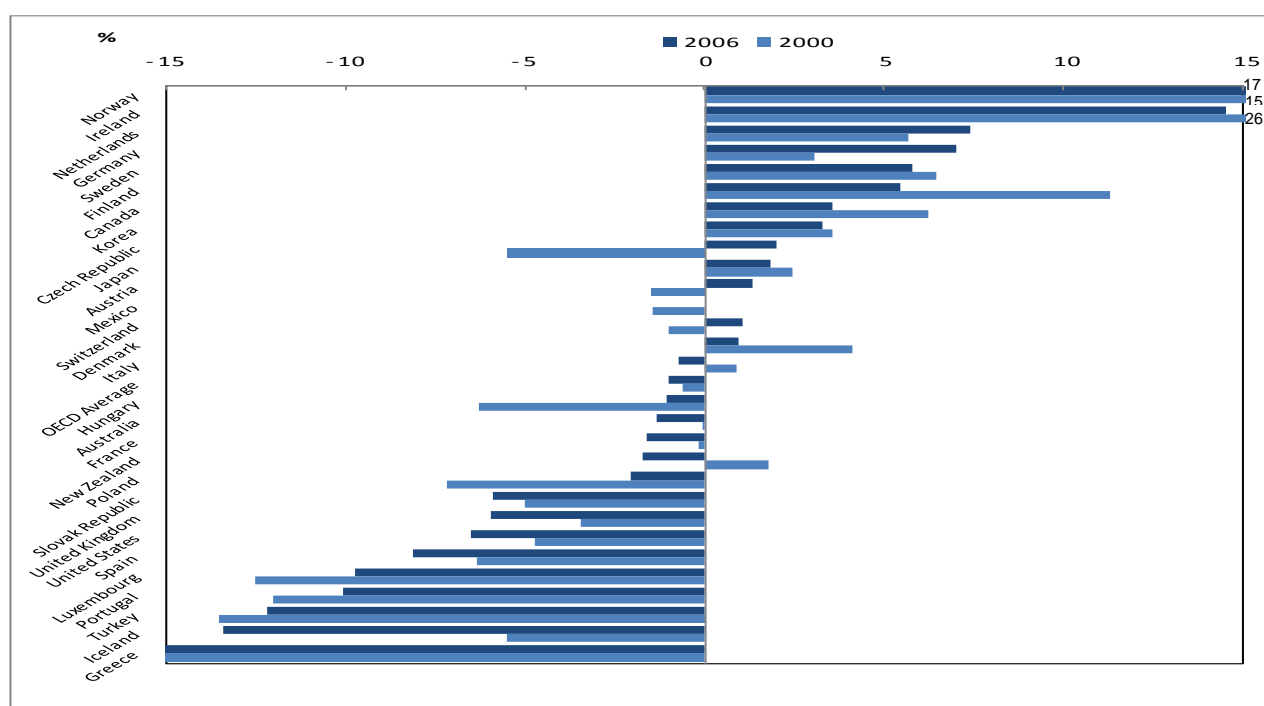


## TRADE BALANCE AS A PERCENTAGE OF GDP

I.2.

**Figure I.2.3. Trade balance in goods as a percentage of GDP in 2000 and 2006**

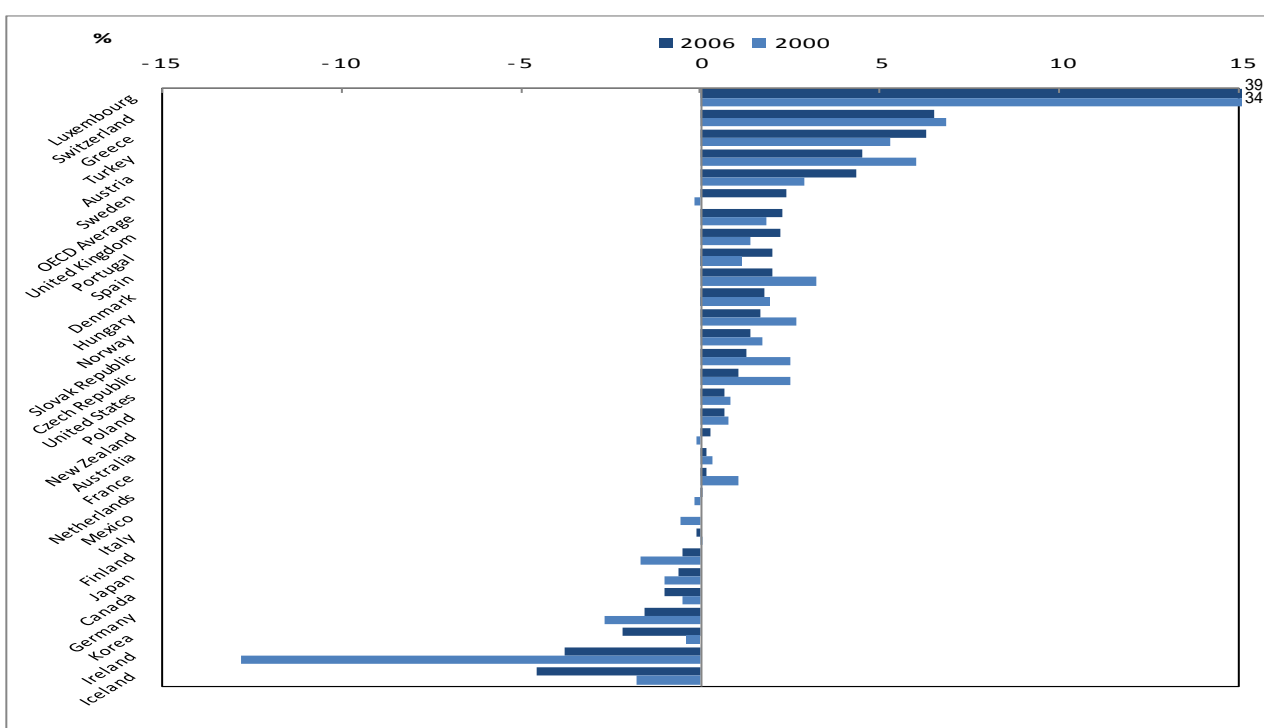
Per cent, current prices



Note: Data for Belgium, Mexico (2006) not available.

**Figure I.2.4. Trade balance in services as a percentage of GDP in 2000 and 2006**

Per cent, current prices



Note: Data for Belgium, Mexico (2006) not available.

The situation of world export market shares of goods and services of OECD countries is shown in figure I.3.1, for 2000 and 2006. The United States remained the largest exporter of goods and services in 2006 with a share of 9.8%, although there was a marked decrease of almost four percentage points between 2000 and 2006. Germany, the OECD country with the second highest share, however could increase its market share by almost one percentage point (from 7.9% to 8.8%) in the same period.

Within the OECD Accession Countries, the Russian Federation was the country with the highest export market share in 2006 (2.2%, up by 0.8% percentage points against 2000). Israel was the only country of this group that experienced a loss of market shares in this period (down by 0.2 percentage points to 0.4%).

China was the country with the highest nominal increase in terms of world export market share of all countries shown in figure I.3.1. The Chinese export market share went up by 3.8 percentage points (to 7.3%) between 2000 and 2006.

The (geometric) average annual growth rates of market shares for total trade, for the period 2000 to 2006, are presented in figure I.3.2. The OECD country with the highest average growth rates was the Slovak Republic with an average annual increase of 10.0%, followed by the Czech Republic (+8.4%) and Poland (+8.0%). The largest average decreases within the OECD were observed for the United States (-5.4% in average per year) and Japan (-5.0%). Of the OECD Accession Countries and the countries of the OECD Enhanced Engagement Program, China and India had the highest annual increases of their export market shares with +13.0% and +10.0% respectively.

The OECD country with the highest export market share of goods (see figure I.3.3.) in the year 2006 was Germany (10.3%, increase of 1.5 percentage points), followed by the United States (share of 9.5%, decrease of 3.0 percentage points against 2000). Germany gained market shares especially on beverages/tobacco, manufactured articles and machinery/transport equipment (see section I.4) while the USA lost market shares for all categories of commodities except mineral fuels/lubricants. The Slovak Republic had the highest average annual growth rate for exports of goods between 2000 and 2006 (+12.2% *p.a.*), followed by Poland (+11.9% *p.a.*) and the Czech Republic (+10.8%), see figure I.3.5.

For exports of services in 2006 (see figure I.3.4.), the United States had the highest world export market share within the OECD (14.9%, down 4.6 percentage points against 2000), followed by the United Kingdom (8.1%, up 0.3 percentage points). Ireland was the country with the highest average annual growth (+13.8% *p.a.*) during this period, followed by Finland (+6.0% *p.a.*), see figure I.3.6.

#### Source

- Database: OECD Trade Indicators, May 2008.
- Non-OECD countries: UNSD National Accounts Main Aggregates Database, May 2008.

#### Websites

- OECD Trade Indicators, [www.oecd.org/std/its/tradeindicators](http://www.oecd.org/std/its/tradeindicators)
- Non-OECD countries: UNSD National Accounts Main Aggregates Database, [unstats.un.org/unsd/snaama](http://unstats.un.org/unsd/snaama).

### Box 3. Export market shares and competitiveness

Traditionally, firms have tended to establish a direct link between trends in their export market shares and competitiveness. The question which needs to be looked at there is under what circumstances an improvement in market shares really corresponds to improved competitiveness.

Export market shares ( $XMS_{ij}$ ) for a country  $i$  and a product  $j$  concern the share of exports ( $X_{ij}$ ) of products  $j$  by firms in country  $i$  in relation to world exports of the product or by reference area (in this document, the world,  $i=1\dots n$ ).

$$XMS_{ij} = \frac{100 X_{ij}}{\sum_{i=1}^n X_{ij}}$$

It is not easy to establish a direct link between export market shares and competitiveness since many factors directly or indirectly affect export market shares. Some of the most important could be:

#### 1. Foreign direct investment

Producing abroad by means of direct investment can generate new exports and supplement existing trade flows. Above a critical threshold, however, particularly if foreign directly investment flows substantially decrease, production abroad can take the place of exports and even turn into important flows back to the country of origin, especially in the case of off shoring activities.

#### 2. Firms' strategic choices

Targeting market share growth rather than profit maximization, or vice-versa, is a strategic choice for firms. The two strategies, however, can be pursued at the same time provided no attempt is made to optimize each separately. Implementing these strategies obviously depends on shareholders' behaviour and also on firms' initial situation as regards production costs.

#### 3. Changes in specialisation

Changes in a country's specialisation can have a direct impact on the market shares of the sectors concerned. Gradual withdrawal, for example, from a low-technology sector, in favour of other, more technology-intensive sectors, will reduce the low-technology sector's market shares and increase those of sectors with a greater degree of specialisation.

#### 4. Slower growth of export markets

A country's market shares can be directly affected if its traditional export markets are going through a recession. In principle, this has nothing to do with the competitiveness of the exporting country – at least in the short term – but it is in every country's interest to export products for which there is a strong demand to regions experiencing growth.

#### 5. Differing growth of domestic demand and foreign demand

If domestic and foreign demands are growing at different rates, the interpretation of market shares could be distorted. When in a given country, for example, domestic demand is growing faster than export markets, a share of production which ought to be exported may go to satisfy excess domestic demand first of all. This phenomenon makes interpreting indicators all the more difficult in that the ensuing decline in export market shares may be accompanied by a rise in the rate of import penetration.

#### 6. Exchange rate fluctuations

Exchange rate movements can influence the way market shares are interpreted in the sense that they alter the structure of relative prices. However, a change in relative prices does not necessarily involve an exchange rate fluctuation.

## WORLD EXPORT MARKET SHARES

I.3.

Figure I.3.1. World export market shares in goods and services

Per cent, current prices

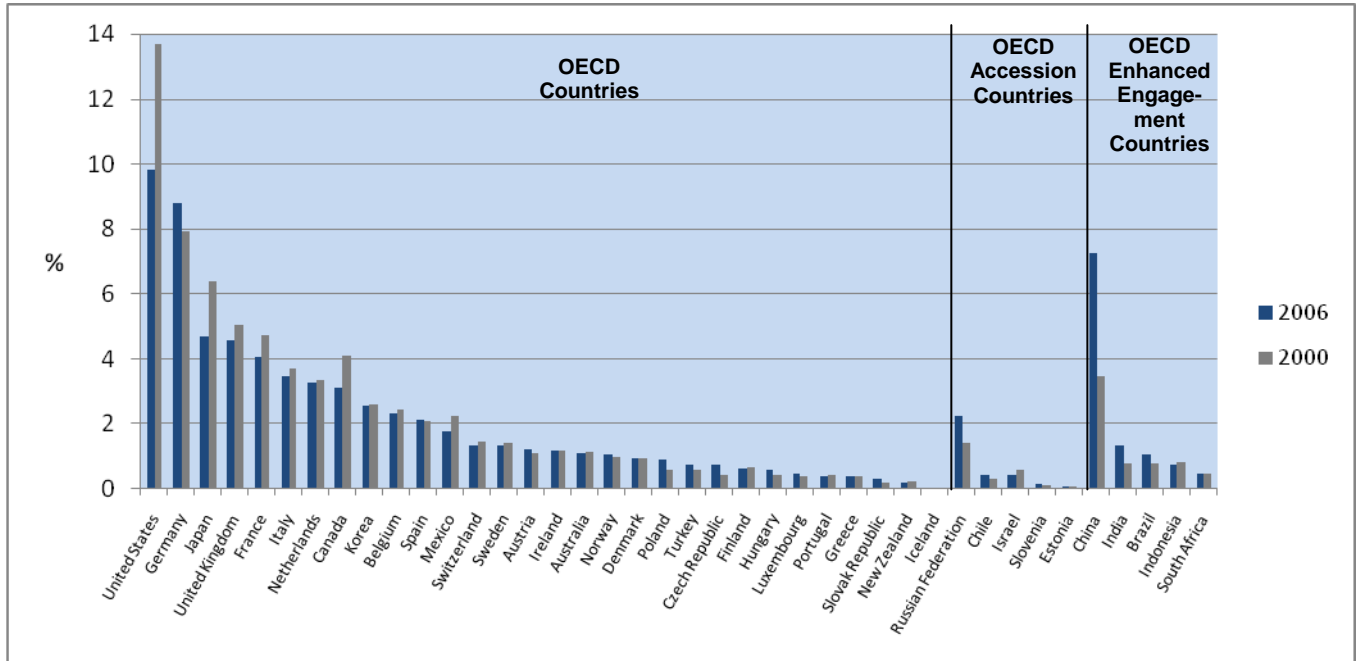
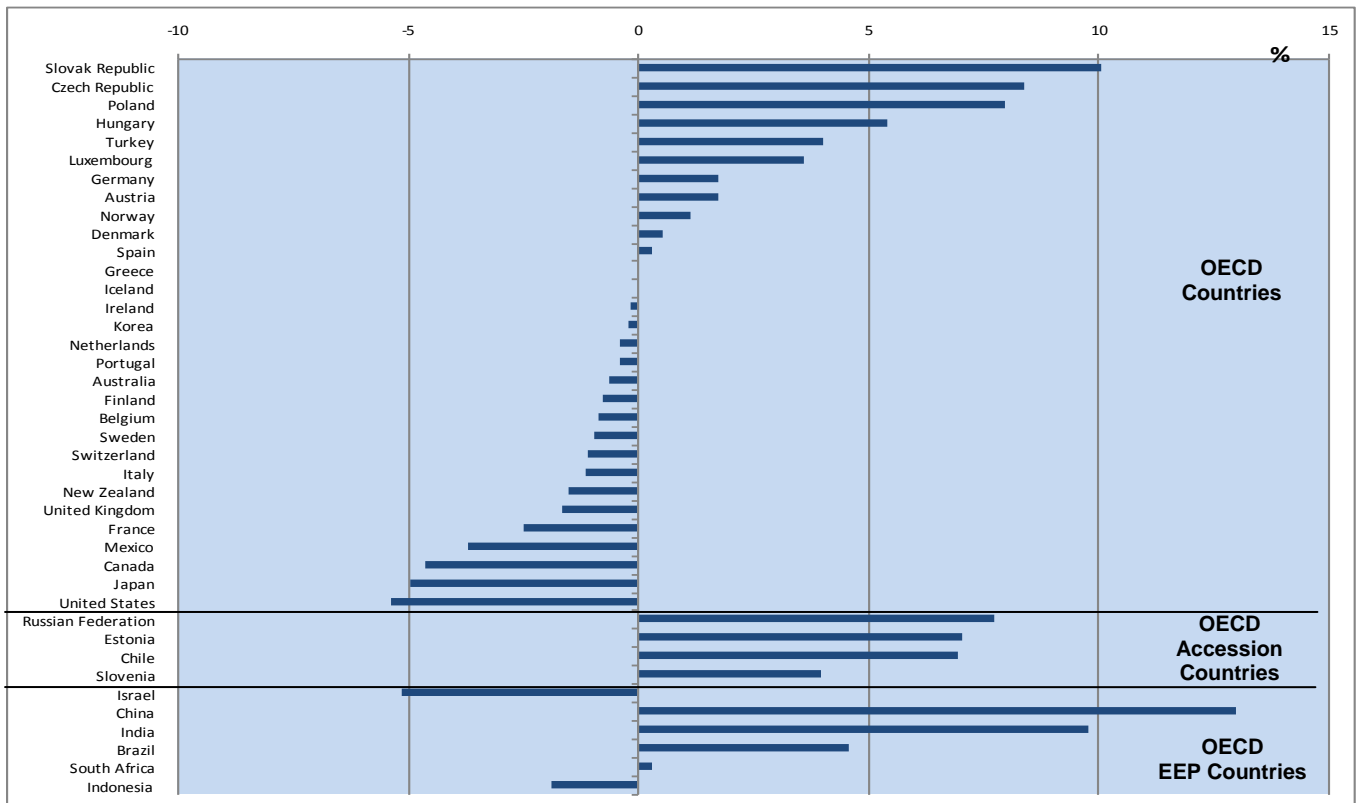


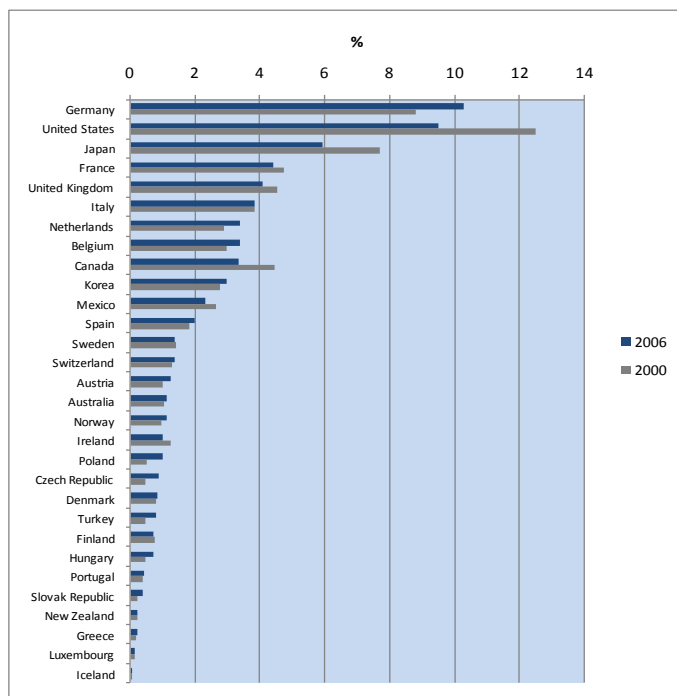
Figure I.3.2. Average annual growth rates of world export market shares in goods and services, 2000-2006

%, Current prices



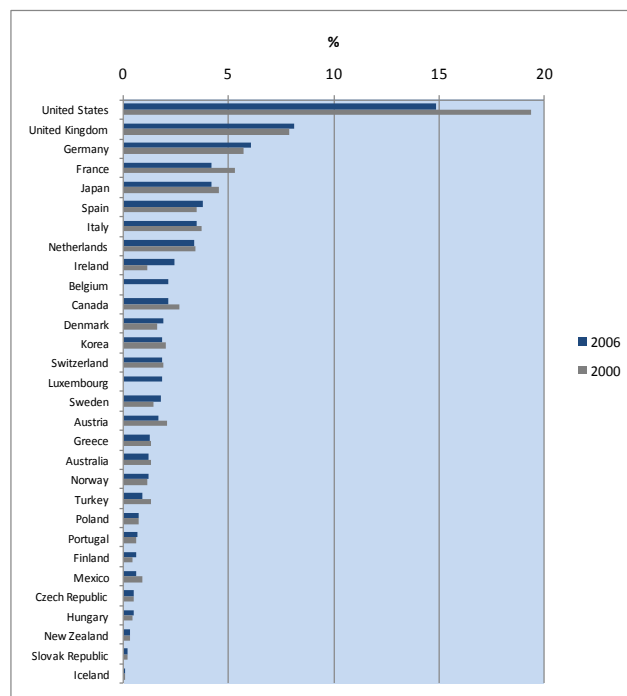
**Figure I.3.3. World export market shares in goods of OECD countries**

Per cent, current prices



**Figure I.3.4. World export market shares in services of OECD countries**

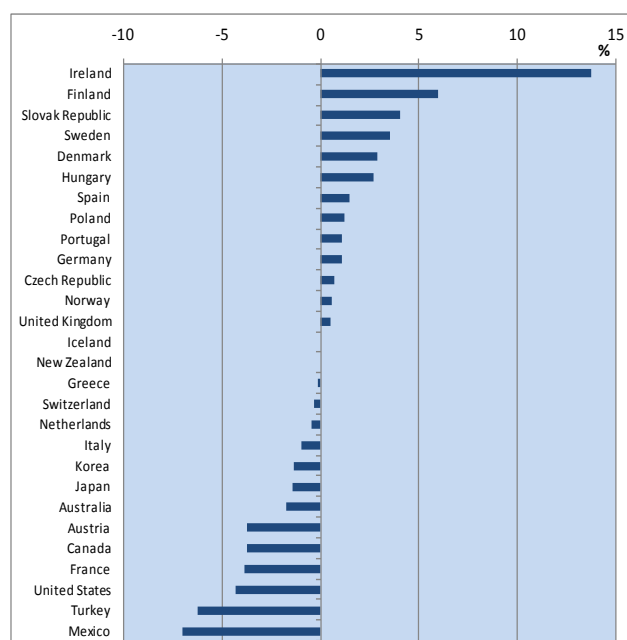
Per cent, current prices



**Figure I.3.5. Average annual growth of world export market shares in goods of OECD countries 2000-2006, current prices**



**Figure I.3.6. Average annual growth of world export market shares in services of OECD countries, 2000-2006, current prices**



Note: Data for Belgium and Luxembourg not available.

Figure I.4.1. shows the top three OECD exporter countries for each group of commodities (SITC classification), for the year 2006.

In 2006, only five OECD countries could be identified among the top exporters for eight commodity groups: **Germany** (“Chemicals and related products”, “manufactured goods classified chiefly by material”, “machinery and transport equipment”), the **United States** (“Food and live animals”, “Crude materials inedible except fuels”, “miscellaneous manufactured articles”), **France** (“Beverages and tobacco”), **Norway** (“Mineral fuels lubricants and related materials”) and **Spain** (“Animal and vegetable oils fats and waxes”). The highest world export market share for a commodity group was observed for France with a percentage of 16% (up 1 percentage point against 2000), for beverages and tobacco.

In comparison to the year 2000 (figure I.4.2.), the United States lost the OECD export market

leadership for three commodity groups (“Animal and vegetable oils fats and waxes”, “chemicals and related products” and “machinery and transport equipment”), while Germany won the leadership for two more commodity groups in 2006.

The most distinct changes in export market shares between 2006 and 2000 were observed for Germany with a gain of 2.9 percentage points for beverages and tobacco and for the United States with a loss of 6.4 percentage points for the same commodity group. Germany’s exports of beverages (+158% between 2000 and 2006) and tobacco (+100%) more than doubled (+128%) during this period, while US exports of tobacco decreased by 52%.

#### Source

- Database: OECD Trade Indicators, May 2008.

#### Websites

- OECD Trade Indicators, [www.oecd.org/std/its/tradeindicators](http://www.oecd.org/std/its/tradeindicators)

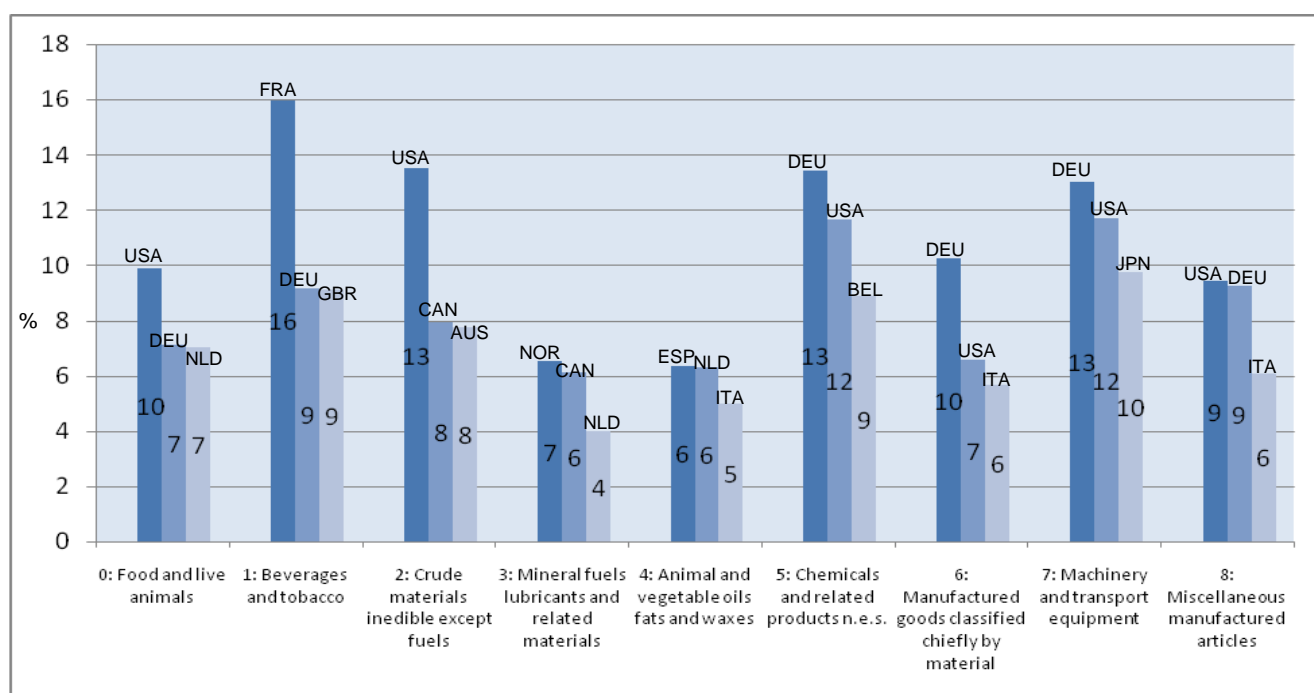


## WORLD EXPORT MARKET SHARES BY TYPE OF GOODS

I.4.

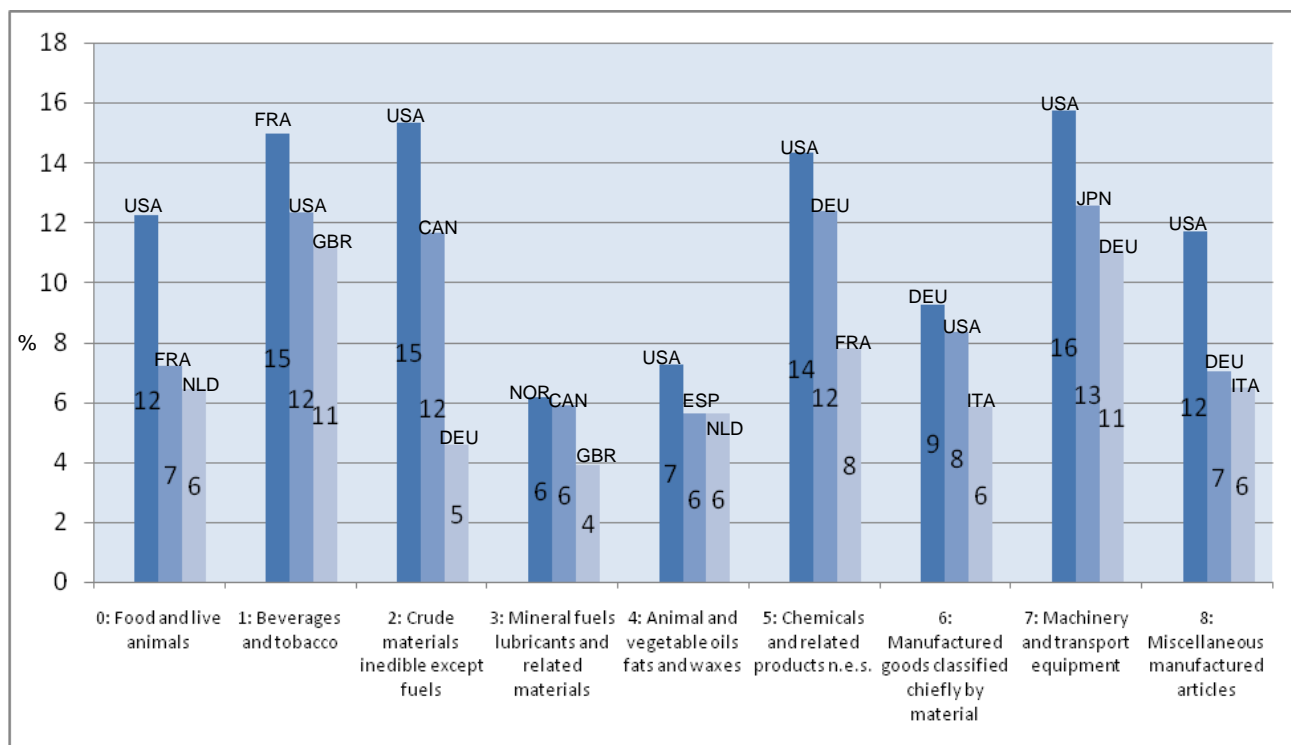
**Figure I.4.1. Top 3 OECD exporters of goods, by category of commodities, 2006**

World export market shares, per cent, current prices



**Figure I.4.2. Top 3 OECD exporters of goods, by category of commodities, 2000**

World export market shares, per cent, current prices



## GEOGRAPHICAL DISTRIBUTION OF EXPORT SHARES IN GOODS IN OECD, ACCESSION COUNTRIES AND ENHANCED ENGAGEMENT COUNTRIES (2006 VERSUS 2000)

**I.5.A**

The largest exporter of goods distributed to the **European Union (EU25)** remained Germany in 2006 with an export market share of 17.3%, slightly less than in 2000 (16.7%) (Figure I.5.a.1.). As shown in figure I.4.1, major exports for Germany to the rest of the world include machinery and transport equipment (including automobiles), chemicals, manufactured goods as well as beverages and tobacco products. During the same period, some important exporters to the European Union recorded export market shares losses, for instance France, the United Kingdom, Italy, the United States, Spain and Japan. The export shares of other European Countries, however, increased, notably for the Netherlands and Belgium as well as for a number of Central European countries: Poland, the Czech Republic and Hungary. China and the Russian federation with respectively 4.5% and 4.2% of total European export market shares in 2006 have also experienced a significant increase.

For the import market of the **United States'** Domestic market (Figure I.5.a.2), three OECD countries accounted for about 48.4% of total export shares in 2006: namely Canada, Mexico and Japan. This aggregate export share is however in sharp decline as it amounted to about 58.1% in 2000. NAFTA agreements have nonetheless secured Canada and Mexico with the highest exports shares into their neighbouring country. Since 2000, China's relative exports shares into the United States have at the same time grown at the average annual rate of 16.9% to reach in 2006 the level of 14.6% of total shares. China has this way left Japan behind in terms of relative export shares into the United States.

The United States' export shares into the **Japanese market** (Figure I.5.a.3) have decreased from a level of 29.6% in 2000 to 18.5% in 2006. This decrease can be looked at side by side to China's simultaneous gains (18.9% in 2000, 28.4% in 2006). Between 2000 and 2006, among the OECD countries, only Australia recorded a significant increase in its Japanese export shares. This can be related to Australia's strong specialisation in the production of crude materials

(figure I.4.1) for which Japan is in particular demand due to its meagre natural resources.

Between 2000 and 2006, some OECD countries lost large export shares into **India** (Figure I.5.a.4). This was for instance the case for the United States (from 13.9% to 11.6%), Belgium (from 12.1% to 6.7%), the United Kingdom (from 11.8% to 5.7%) and Japan (from 9.4% to 5.1%). During the same period, China's export shares increased from the level of 5.9% in 2000 to 16.8% in 2006. This trend illustrates the growing "south-south" trade which is gradually replacing more traditional trading links established on historical grounds.

Except for Germany, Australia and Korea, OECD countries have in general lost relative export shares into **China and Hong Kong (China)** (Figure I.5.a.5). Global export championship, specialisation in exports of crude material and geographical proximity can respectively explain the still good performances of the three OECD countries into the Chinese market. Among the OECD countries, Japan remained the most important exporter to China (including Hong Kong, China). This dominance is mitigated by the relative decrease of its export shares into the Chinese market (from 30.1% to 26.0%) during the reference period.

Japan and the United States have both experienced, from 2000 to 2006, a decrease in their export shares into the **Asian Market** (Figure I.5.a.6) from 19.4% to 15.2% and from 20.4% to 13.6% respectively. Small size exporters from the Central European countries such as the Slovak republic, Poland and Hungary, are gaining market shares into **Asia**. China's export shares have jumped from 12.5% to 20.9%. Due to the diversity of its economic base, the volume of India's trade with the rest of Asia is still low but however increasing from 1.5% in 2000 to 2.8% in 2006.

### Source

• Database: OECD ITCS, June 2008, for non OECD countries UN Comtrade.

Website [www.oecd.org/std/trade-goods](http://www.oecd.org/std/trade-goods)

**Box 4. Geographical distribution of export shares.**

For each OECD Country, Accession Country or Enhanced Engagement Country i, the export shares  $XS_i$  referring to another country j of the same grouping are measured as follows:

$$XS_i^j = 100 \frac{X_i^j}{\sum_i^n X_i^j} \text{ with } n = 40 \text{ (total number of OECD Countries, Accession Countries and Enhanced Engagement Countries) and } i \neq j.$$

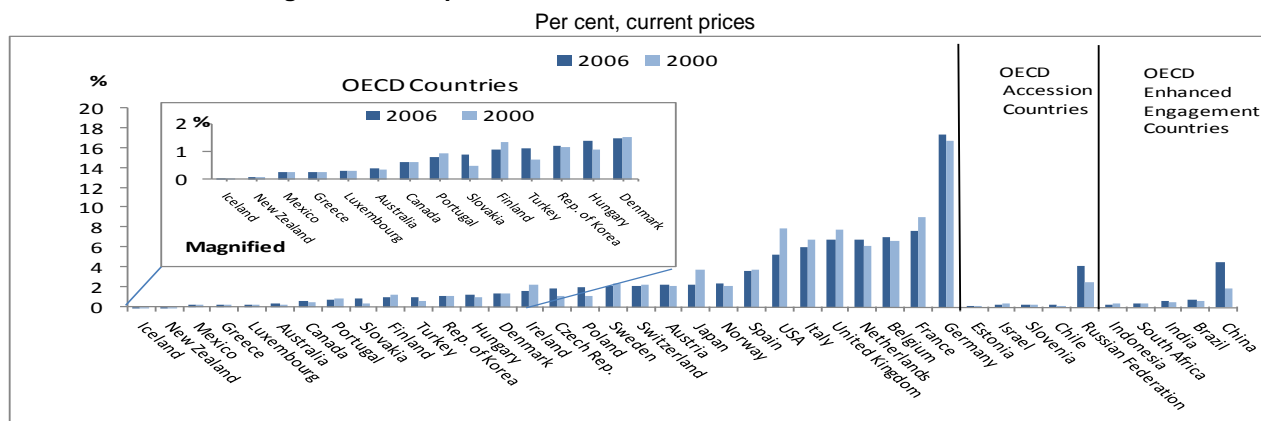
Where

$XS_i^j$  ; export shares of country i in country j

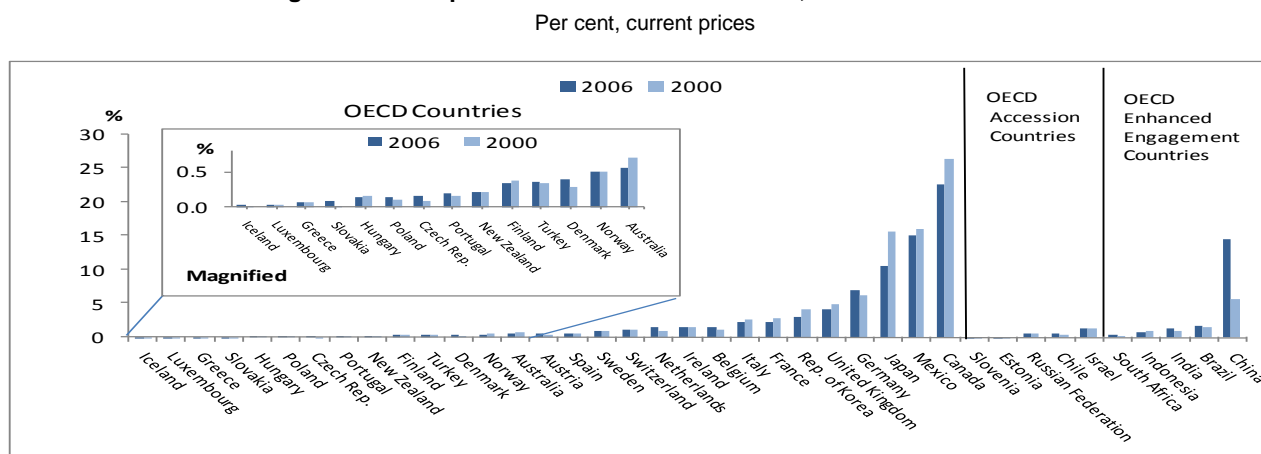
$\sum_i^n X_i^j$  : Total exports of 39 countries (except exports of country j) destined for country j (40 countries if j is neither an OECD Country, an Accession Country or an Enhanced Engagement Country)

# **GEOGRAPHICAL DISTRIBUTION OF EXPORT SHARES IN GOODS IN OECD, ACCESSION COUNTRIES AND ENHANCED ENGAGEMENT COUNTRIES 2006 VERSUS 2000.**

**Figure I.5.a.1 Export shares of Goods into EU25, 2006 versus 2000.**



**Figure I.5.a.2 Export shares of Goods into USA, 2006 versus 2000.**



**Figure I.5.a.3 Export shares of Goods into Japan, 2006 versus 2000.**

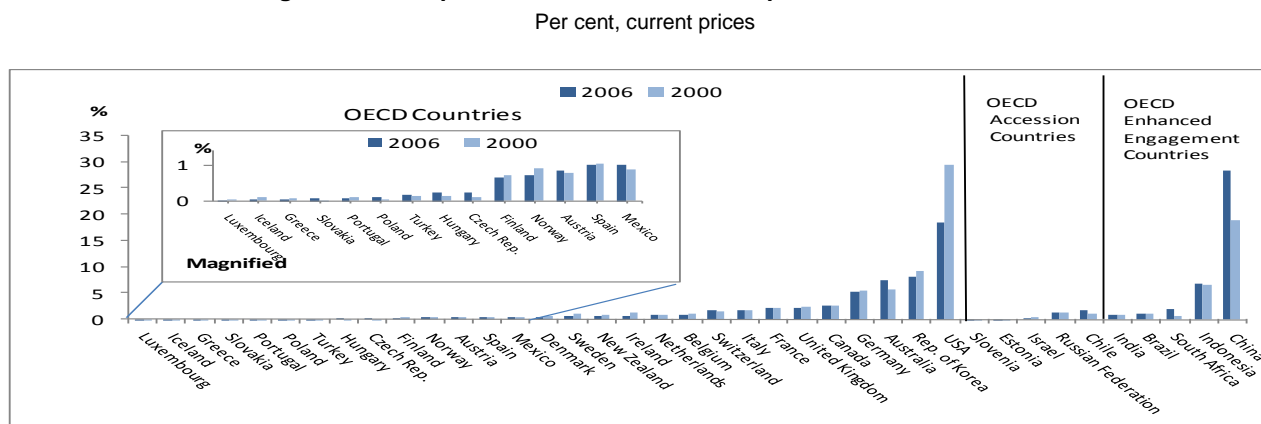


Figure I.5.a.4 Export shares of goods into India, 2006 versus 2000.

Per cent, current prices

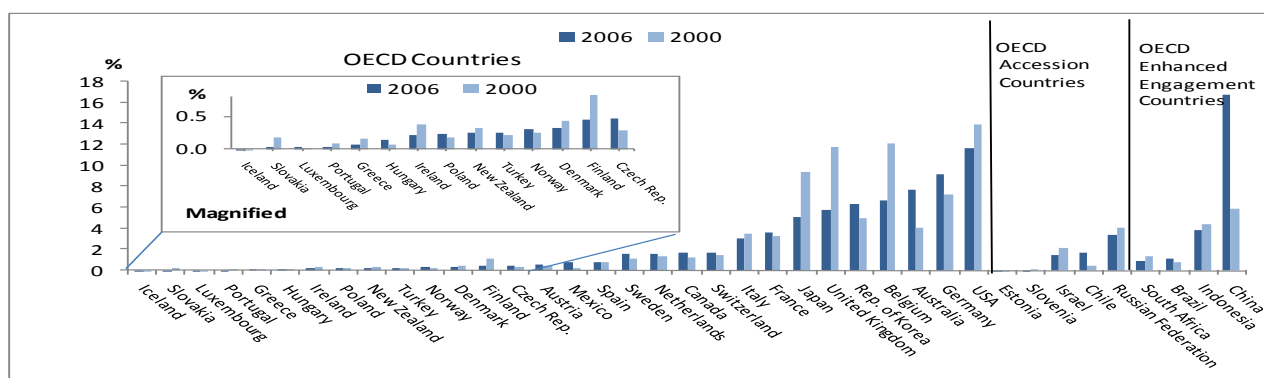


Figure I.5.a.5 Export shares of goods into China and Hong Kong (China), 2006 versus 2000.

Per cent, current prices

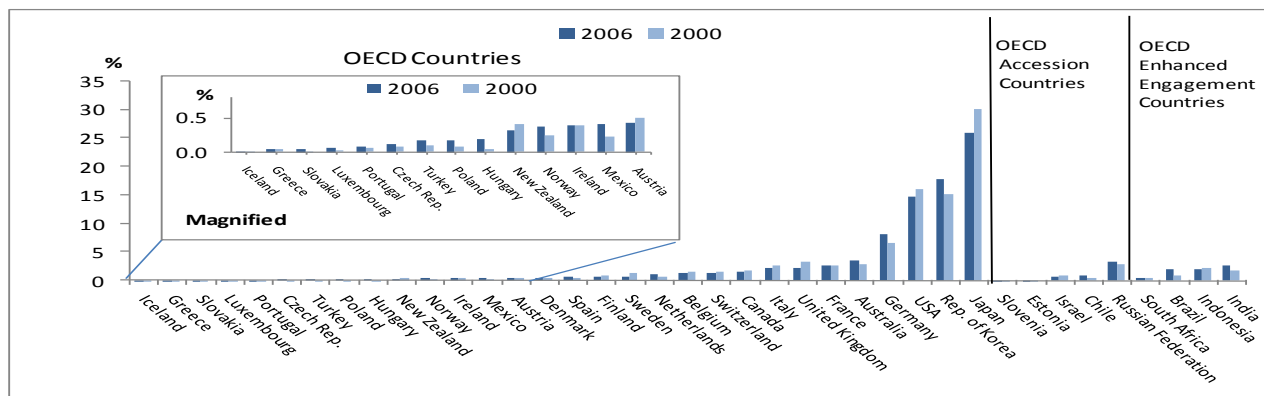
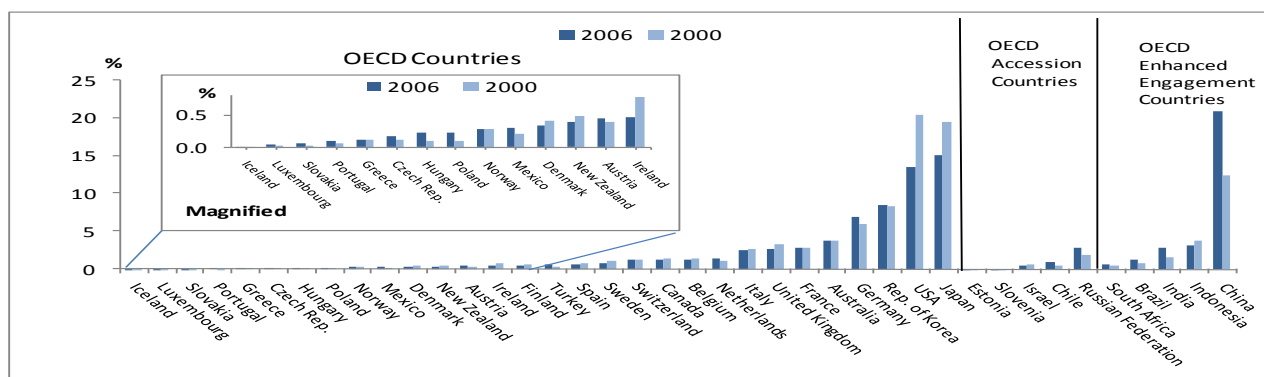


Figure I.5.a.6 Export shares of goods into Asia, 2006 versus 2000.

Per cent, current prices



## GEOGRAPHICAL DISTRIBUTION OF EXPORT SHARES IN SERVICES IN AVAILABLE OECD COUNTRIES (2005 VERSUS 2000).

**I.5.B**

The United States is by far the largest OECD services exporter (relative to available OECD countries in 2000 and 2005) to the **European Union** (Figure I.5.b.1). This leading position however weakened as the United States held 26.6% of services export shares in 2000 and 22.3% in 2005. The United Kingdom, Germany, Spain and Japan are among the countries that have slightly improved their export share position over the period.

The United Kingdom has improved its relative export market share in services **into the United States** (Figure I.5.b.2) from 17.0% to 18.4% during the reference period. This trend can be linked to the United Kingdom's specialisation in insurance and financial services provided to the rest of the world including the United States and to the growing importance of these service activities in the globalised economy. Canada, Japan and France's relative export shares have decreased while Germany, Norway, Denmark and Ireland have improved their relative export shares. Ireland's improvement (from 1.1% to 2.0%) can be explained by its specialisation in computer and information services which is also a crucial service activity in the integrated world economy. It should however be noted that at the same time Ireland is paying very large Royalties and license fees to the rest of the world (half of the total amount going to the United States).

The United States with about 55.9% of the **Japanese** relative service export shares (figure I.5.b.3) confirmed its leading position in this market. The United Kingdom, Korea, Germany, France and Australia were behind the United States the main service exporters to Japan. Korea

is registering the most important loss of export shares during the reference period (from 11.9% in 2000 to 8.6% in 2006).

United States covered 39.3% of **Indian** export market shares (figure I.5.b.4) in 2005. This remained a predominant proportion but there was however a notable decrease compared to the 46.2% held in 2000. The United Kingdom, Germany and Australia appear among the countries that have improved their relative export shares into India.

The United States' and Japan's relative export shares (respectively 24.1% and 18.8% in 2005) continue to dominate the OECD's services exports to **China** (figure I.5.b.5) but less strongly than in 2000 (respectively 34.4% and 24.2%). Korea, Germany, United Kingdom, France and Australia have gained export shares while Canada, Austria and Italy experienced a decrease in their relative export shares.

In the **Asian Market** (figure I.5.b.6), the United States still takes the bulk of the export shares with 41.9% of the total (compared to 50.7% in 2000). Japan, United Kingdom, Germany, the Netherlands, Australia are among the OECD countries that have seen their relative market shares expand over the period.

### Source

• Database: **OECD Trade in Services by Partner Country, June 2008.**

website

<http://www.oecd.org/std/trade-services>

### Box 5. Geographical distribution of export shares.

For each available OECD Country  $i$ , the export shares  $XS_i^j$  referring to another country  $j$  of the same grouping are measured as follow:

$$XS_i^j = 100 \frac{X_i^j}{\sum_i^n X_i^j} \text{ with } n = 30 \text{ (total number of OECD Countries) and } i \neq j.$$

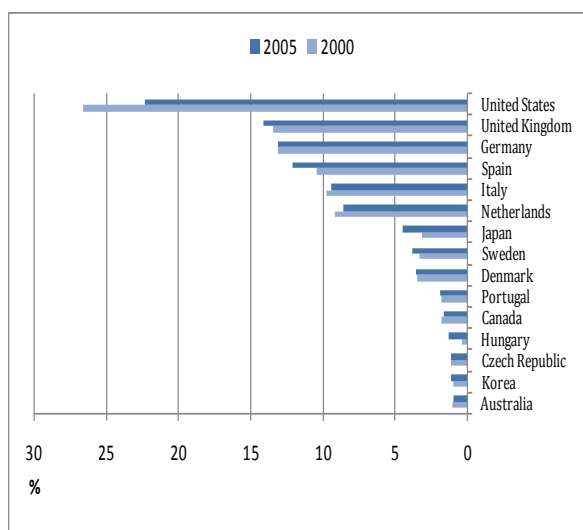
Where

$XS_i^j$  : export shares of country  $i$  in country  $j$ .

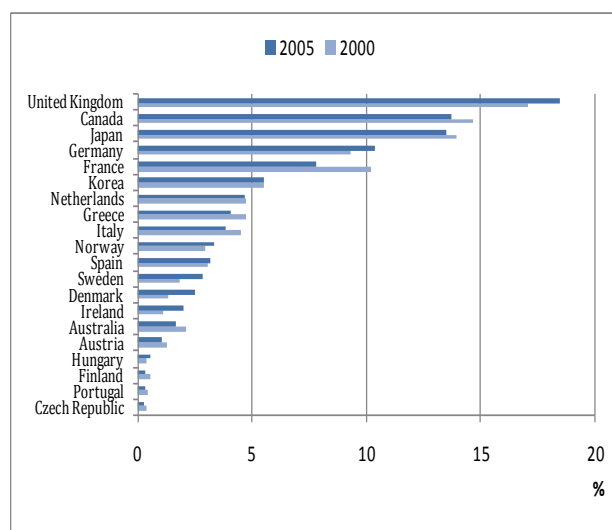
$\sum_i^n X_i^j$  : Total exports of 29 countries (except exports of country  $j$ ) destined for country  $j$  (30 OECD countries if  $j$  is not an OECD country).

## GEOGRAPHICAL DISTRIBUTION OF EXPORT SHARES IN SERVICES IN AVAILABLE OECD COUNTRIES - 2005 VERSUS 2000.

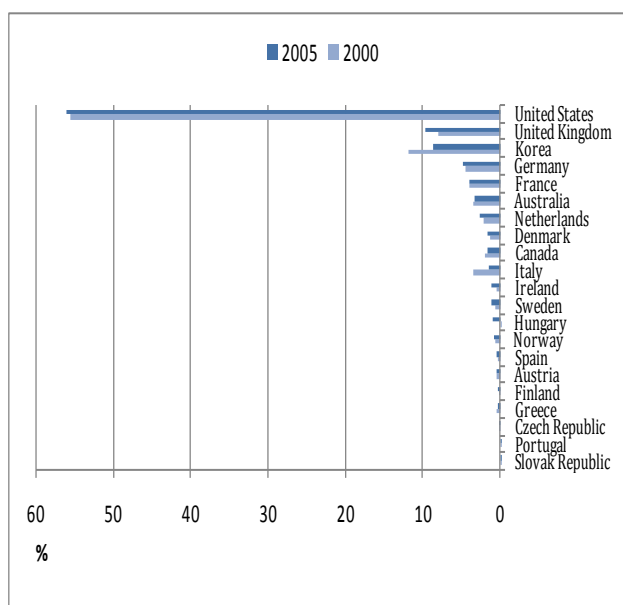
**Figure I.5.b.1 Export shares of services into the EU25.  
2005 versus 2000**  
Per cent, current prices



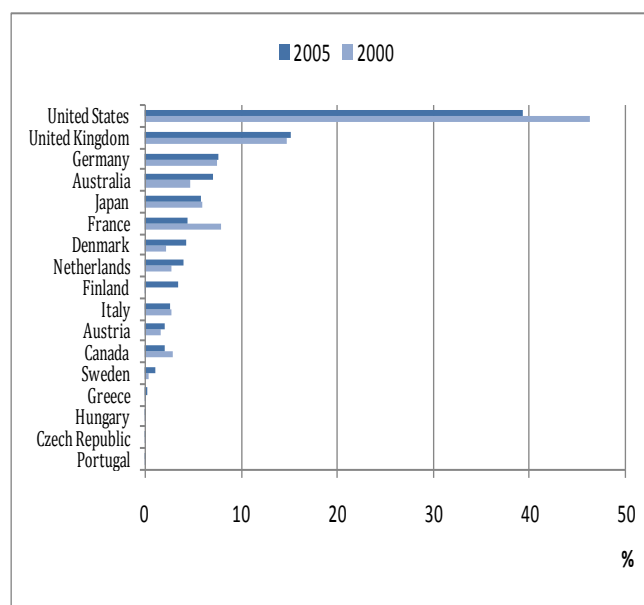
**Figure I.5.b.2 Export shares of services into the US.  
2005 versus 2000**  
Per cent, current prices



**Figure I.5.b.3 Export shares of services into Japan.  
2005 versus 2000.**  
Per cent, current prices



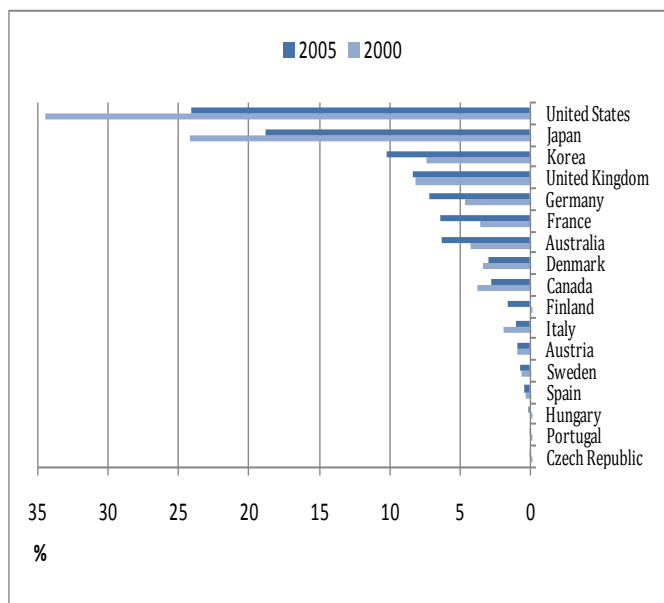
**Figure I.5.b.4 export shares of services into India.  
2005 versus 2000.**  
Per cent, current prices



1. Source: OECD, International Trade in Services by partner country (TISP), May 2008
2. Total OECD is calculated by the sum of the available countries shown on the graph.
3. Partner Asia for United States refers to Asia and Oceania less Australia
4. Partner China and Hong Kong China for Korea refers to China.

**Figure I.5.b.5 Export shares of services into China and Hong Kong (China). 2005 versus 2000.**

Per cent, current prices



**Figure I.5.b.6 Export shares of services into Asia. 2005 versus 2000.**

Per cent, current prices

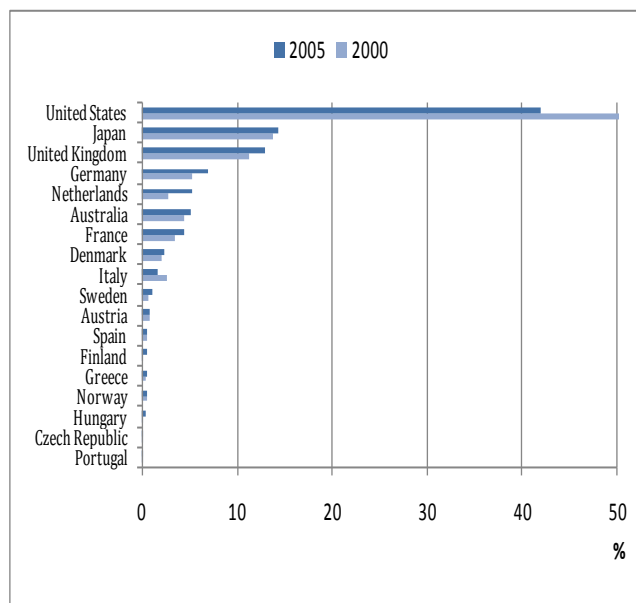




Figure I.6.1 confirms that the highest import penetration of goods and services is observed in the smaller countries like Luxembourg (import penetration rate of 194% in 2006), Belgium (87%), the Slovak Republic (86%), Hungary (78%) and Ireland (78%), and the lowest in the bigger countries such as Japan (15%) and the United States (16%). This figure also shows that import penetration is correlated to the export ratio (X/GDP) (see Figure I.1.1).

Within the OECD Accession Countries, Estonia was the country with the highest import penetration rate (85% in 2006), followed by Slovenia (69%). While the import penetration rates of Slovenia, Israel and Chile increased between 2000 and 2006, the rates of Estonia and especially of the Russian Federation decreased in the same period. Of the OECD Enhanced Engagement countries, China was the country with the highest import penetration rate (36% in 2006, up by 14 percentage points against 2000), followed by South Africa (30%). Also India's import penetration rate showed a rather high increase between 2000 and 2006 (25% in 2006, up by 11 percentage points against 2000).

Figure I.6.2 shows the import penetration rates for goods of OECD countries, for 2000 and 2006. In contrast to the situation for total trade (figures I.6.1.), it was here the Slovak Republic with the highest import penetration rate (78% in 2006, up by 15 percentage points against 2000)

instead of Luxembourg that comes second in this case with a value of 69%. Distinct negative changes in the ratios were especially observed for Ireland (-21 percentage points against 2000) and Canada (-7 percentage points). The reasons for these negative changes for Ireland and Canada were not decreasing import values but the fact that the Gross Domestic Product of these countries increased notably more than the value of imports. It was the opposite for countries such as the Slovak Republic whose imports increased more than their GDP.

The import penetration rates for trade of services are presented in figure I.6.3. The country with the by far highest degree of import penetration of services was Luxembourg (125%, up by 25 percentage points against 2000), followed with a decent distance by Ireland (40%, both in 2006 and 2000). The OECD countries with the lowest degrees of import penetration for services were Turkey (2%), the United States (3%) and Japan (3%).

#### Source

- Database: OECD Trade Indicators, May 2008.
- Non-OECD countries: UNSD National Accounts Main Aggregates Database, May 2008.

#### Websites

- OECD Trade Indicators, [www.oecd.org/std/its/tradeindicators](http://www.oecd.org/std/its/tradeindicators)
- Non-OECD countries: UNSD National Accounts Main Aggregates Database, [unstats.un.org/unsd/snaama](http://unstats.un.org/unsd/snaama).

#### Box 6. Import penetration rate

The rate of import penetration (MPI<sub>ij</sub>) for a country *i* and a product *j* corresponds to the share of domestic demand (D<sub>ij</sub>) in country *i* for product *j*, which is met by imports M<sub>ij</sub>.

$MPI_{ij} = 100 M_{ij}/D_{ij}$ . If *P*, *X* and *M* stand respectively for a country's output, export and imports, its domestic demand, D<sub>ij</sub> will be equal to  $D = P - X + M$  and then the import penetration in country *i* for product *j* will be

$$MPI_{ij} = 100M_{ij}/(P - X_{ij} + M_{ij}).$$

Competitiveness on the domestic market, as measured by the rate of import penetration, is based on the notion that a national industry endeavours to win, or at least keep, its shares in its own market. A low import penetration rate does not necessarily reflect import barriers but may be due to a good matching of output to domestic demand by highly competitive domestic firms capable of confronting foreign competition. Conversely, a high import penetration rate could reflect weak competitiveness on the part of domestic firms, especially when the export ratio is low. The size of the countries involved is also very important. The level of import penetration is usually greater in small countries because they are more open to the world economy and because of the way they specialize. As they are unable to specialise in many sectors, they become more dependent on imports. In the longer term, however, if the import penetration rises faster than domestic demand and is not accompanied by equivalent gains in export markets, this could indicate some deterioration of competitiveness..

Figure I.6.1. Import penetration rates for goods and services, 2000 and 2006

Per cent, current prices

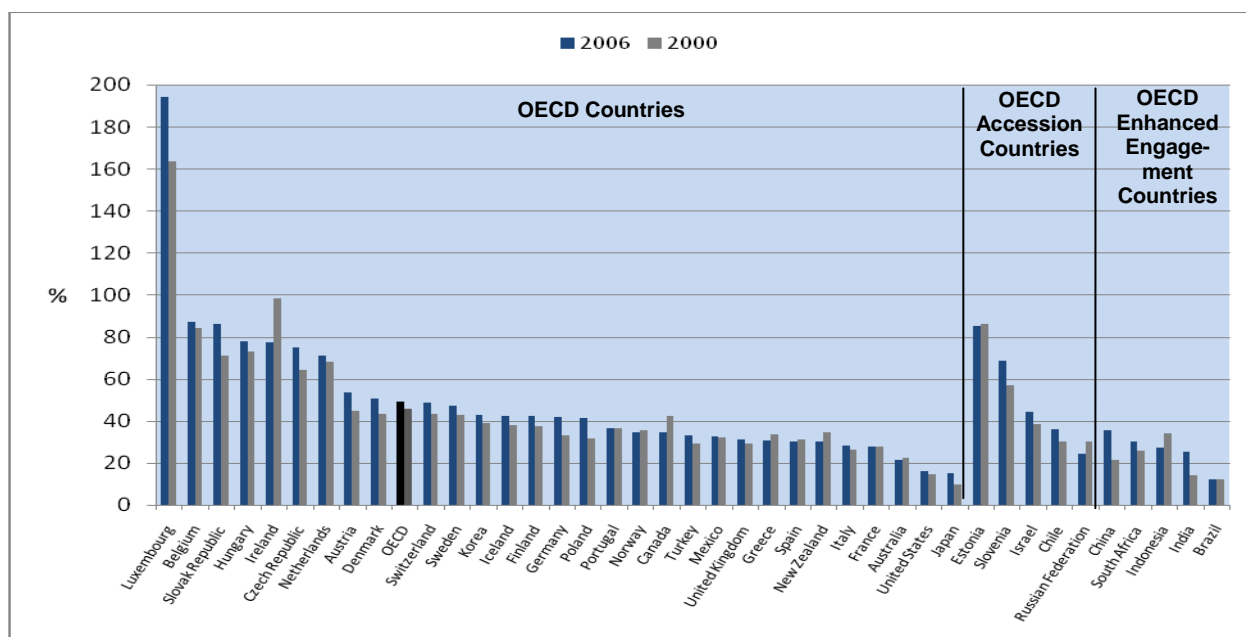
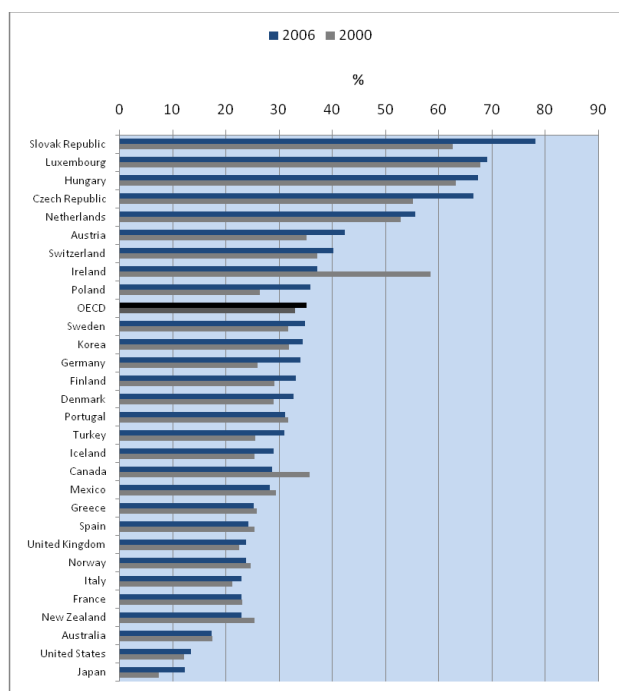


Figure I.6.2. Import penetration rates for goods, 2000 and 2006

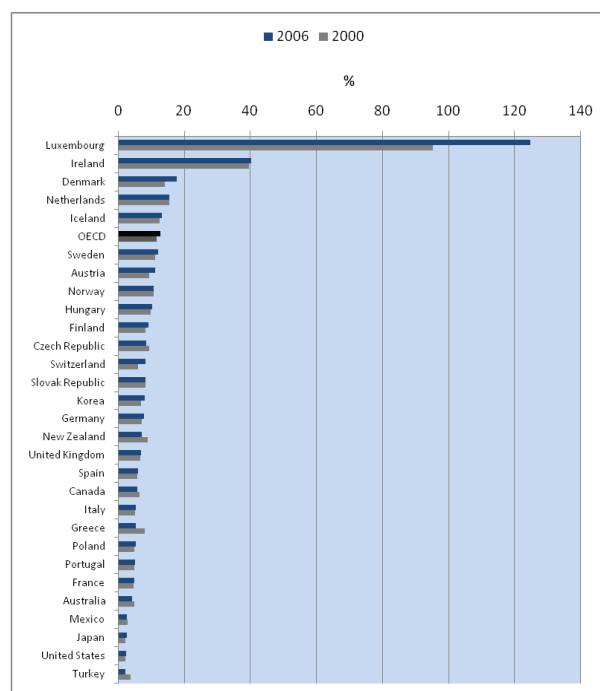
Per cent, current prices



- Figures for Belgium not available, average figure for OECD relates to OECD without this country.
- Data for Mexico not available for 2006, figure refers to 2004.

Figure I.6.3. Import penetration rates for services, 2000 and 2006

Per cent, current prices



- Figures for Belgium not available, average figure for OECD relates to OECD without this country.
- Data for Mexico not available for 2006, figure refers to 2004.

The figures of this section illustrate the remarkable increase of imports of goods from China including Hong Kong (China) to the OECD countries. Only Japan has succeeded in aligning its exports on its imports from China and this way limit its trade deficit or even generate trade surplus. The bulk of China's exports consists of manufactured goods, of which Computers, Telecommunications equipment Clothing, Electrical machinery and semiconductors.

The **United States'** persistent Trade in goods deficit to China including Hong Kong (China) (Figure 7.1) has been steadily growing and reached USD 241 billion in 2006. This means that in 2006, more than one-fourth of the United States negative balance to the World could be explained by its trade deficit with China and Hong Kong (China), (only one-fifth in 1999).

**Japan** (Figure 7.2) has shown a trade surplus since 2002, the surplus peaking in 2004 at the low level of USD 9.2 billion. The relatively high level of exports of Japan to Hong Kong (China) explains that among the selected four reporter countries, only Japan succeeds in

generating a trade surplus with China and Hong Kong (China). A look at the trade balance with mainland China alone during the same period reveals a persistent Trade in goods deficit of around USD 20 billion.

The **European Union's** (Figure 7.3) trade deficit with partner China and Hong Kong (China) has deepened since 2002. This would also correspond to the entry into force of the Euro currency and the continuous appreciation of the European currency against the Yuan contributing to a competitively priced provision of Chinese manufactured goods to European consumers.

The deterioration of the total **OECD** (Figure 7.4) balance to China and Hong Kong (China) has accelerated since 2002, the trade deficit going beyond USD 400 billion in 2006.

**Source**

• Database: *OECD International Trade by Commodity Statistic (ITCS), HS 1996, June 2008.*

*OECD Economic Surveys: China - Volume 2005 Issue 13*

**Website**

[www.oecd.org/std/trade-goods](http://www.oecd.org/std/trade-goods)

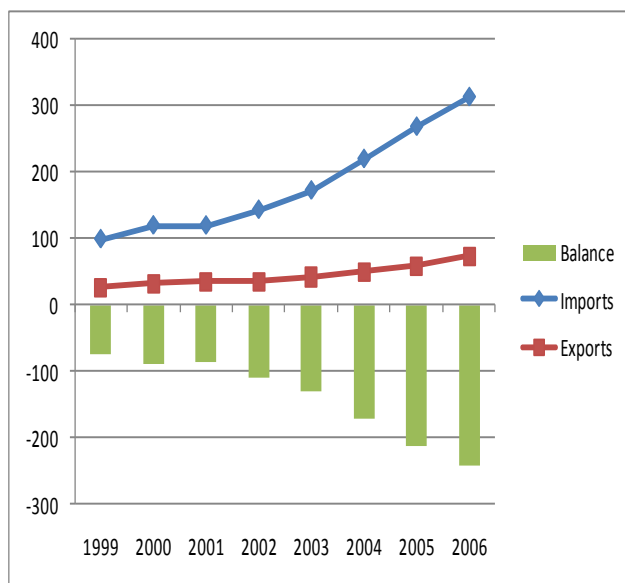
**Box 7. Trade balance**

The trade balance (export less import) is probably the macro-economic indicator that is most frequently used to gauge the competitiveness of a country or of a sector or product at national level.

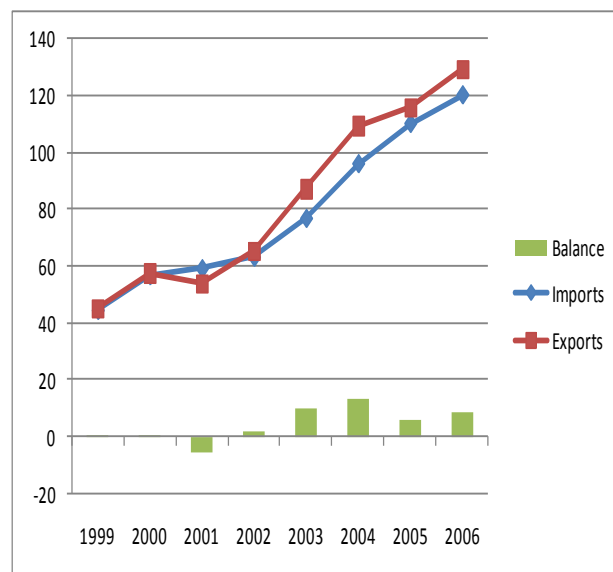
If the trade balance with a particular country is looked at, it allows the reader to assess if the reporter country has a trade surplus or a trade deficit with this specific country.

## I.7. MERCHANDISE TRADE WITH PARTNERS CHINA AND HONG KONG (CHINA)

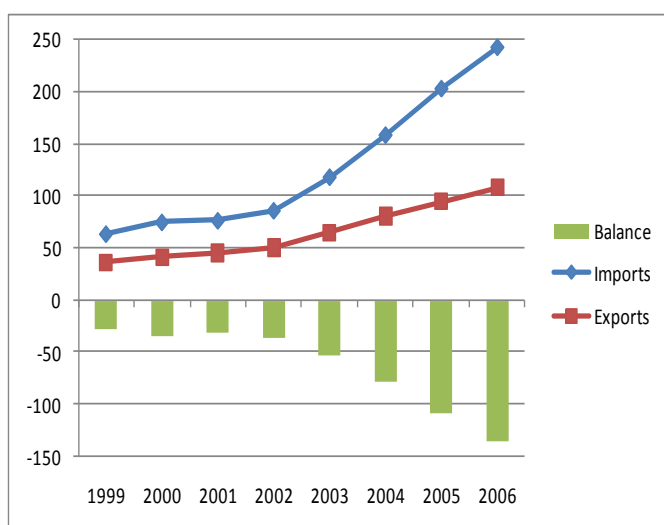
**Figure 7.1. US merchandise trade with China and Hong Kong (China)**  
Billion US dollars



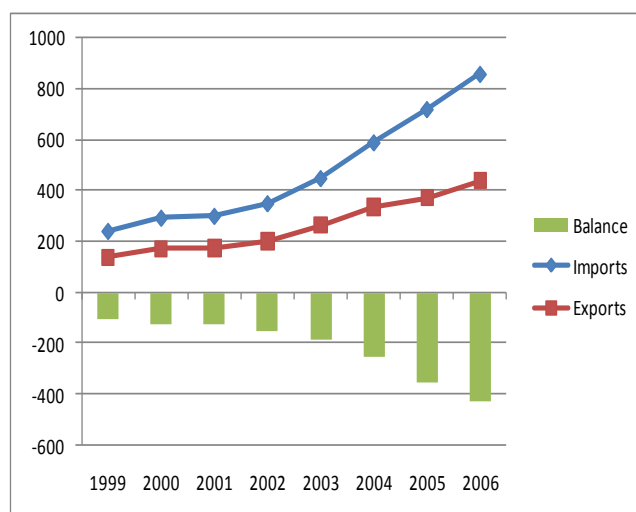
**Figure 7.2. Japan merchandise trade with China and Hong Kong (China)**  
Billion US dollars



**Figure 7.3 EU15 merchandise trade with China and Hong Kong (China)**  
Billion US dollars



**Figure 7.4. OECD merchandise trade with China and Hong Kong (China)**  
Billion US dollars



The **United States** (Figure 8.1) present a persistent and increasing trade deficit with the rest of the world. This deficit reached the record level of USD 882 billion in 2006. If related to figure 7.1, more than one quarter of this deficit can be explained by the United States' deficit to partner China and Hong Kong (China). As shown in figure I.4.1 the United States remained in 2006 the OECD's top exporter for food and live animals, crude materials and miscellaneous manufactured articles. They held the second position for chemicals and related products and machinery and transport equipment.

**Japan** (Figure 8.2) has maintained a positive trade balance with the rest of the world on the reference period (with a USD 67 billion surplus in 2006). The Japanese recession at the turn of the century particularly affected exports of computers, electronics, metals and shipbuilding; however Japan has succeeded in preserving its trade surplus in spite of a sharply devalued U.S. dollar relative to the Japanese yen. Japan is the number three exporter of machinery

and transport equipment of the OECD (figure I.4.1)

The **EU15** (Figure 8.3), despite presenting almost equilibrium in its trade with the rest of the world, (exporting roughly as much as importing), did not generate trade surpluses during the reference period. The trade deficit in 2006 reached the level of USD 142 billion.

**OECD's** trade deficit (Figure 8.4) has been steadily growing during the reference period to reach the level of USD 898 billion in 2006. If a parallel is made with figure 7.4 presenting the OECD's trade relation with China and Hong Kong (China), it is noticeable that (almost) half of OECD's trade deficit to the world can be explained by its deficit with this partner.

#### Source

Database: *OECD International Trade by Commodity Statistics (ITCS)*, HS 1996, June 2008.

#### Website

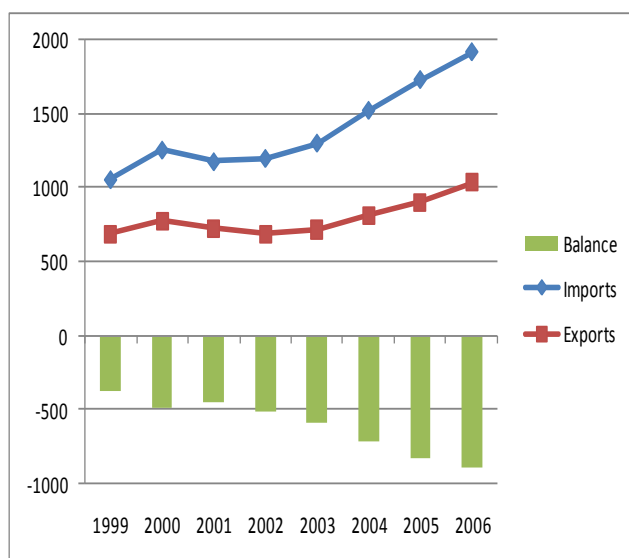
[www.oecd.org/std/trade-goods](http://www.oecd.org/std/trade-goods)

#### Box 8. Trade balance

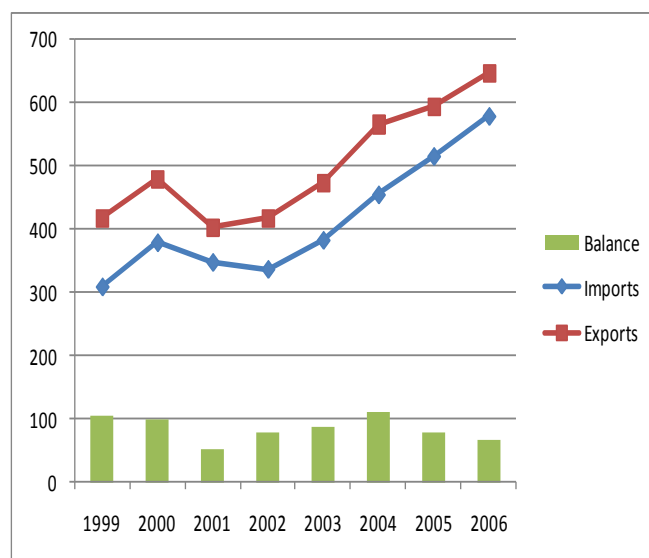
The trade balance (export less import) is probably the macro-economic indicator that is most frequently used to gauge the competitiveness of a country or of a sector or product at national level.

If the trade balance with the rest of the world is looked at, it allows the reader to assess if the reporter country has a trade surplus or a trade deficit with the rest of the world.

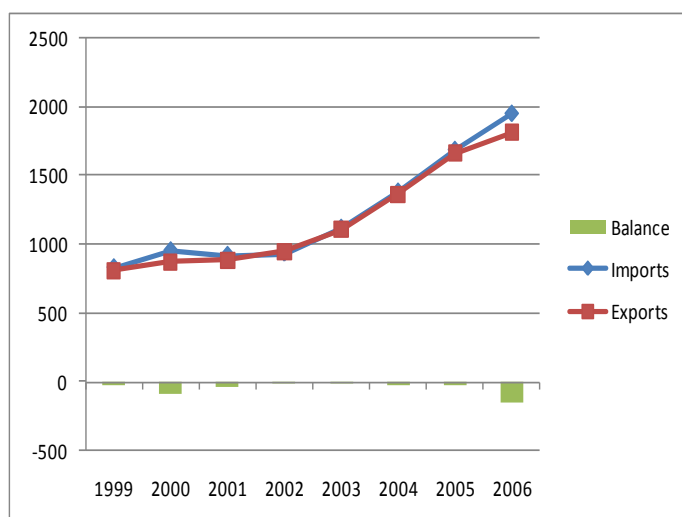
**Figure 8.1. US merchandise trade with rest of the world**  
Billion US dollars



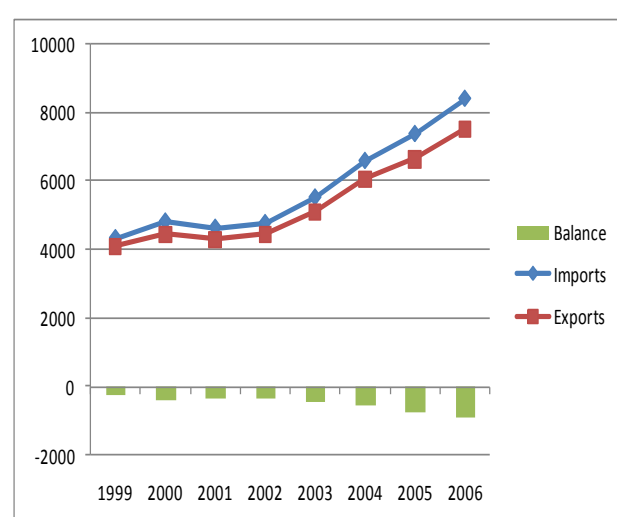
**Figure 8.2. Japan merchandise trade with rest of the world**  
Billion US dollars



**Figure 8.3. EU15 merchandise trade with rest of the world**  
Billion US dollars



**Figure 8.4. OECD merchandise trade with rest of the world**  
Billion US dollars



Simultaneous exports and imports within the same industry are generally labelled as intra-industry trade. It typically occurs among rich countries with similar levels of development and economic structure, and which are geographically close; it is often regarded as a corollary of smooth economic integration.

Over the period 1996-2006, the average index of intra-industry trade in manufactures was high (over 70%) in many OECD countries, as well as in Slovenia and in Estonia. Since 2001, Hungary, the Slovak Republic, Poland and Portugal have experienced high growth in intra-industry trade in manufactures, while among the accession countries, only Estonia has experienced high growth. In several other countries, such as the OECD-European countries, intra-industry trade in manufacturing remains fairly vibrant, although it has not increased significantly over the past five years. The geographical isolation of Chile may explain its relative low integration in the global economy. The relatively high growth rates of India and Indonesia (2.8% and 3.5%, respectively) confirm their increasing production and trade of intermediate goods. China's

economy is well integrated and its intra-industry trade in manufactures has grown at the robust rate of 1.2% on average, over the five past years.

In some Central and Eastern European countries, the high level and fast growth of intra-industry trade in manufactures may stem from the large volume of direct investment in those countries, notably from Germany. The shift to these countries of numerous activities of foreign multinationals was conducive to a relatively swift rise in intra-industry trade over the course of the 1990s. Japan's low level of intra-industry trade in manufactures is due to the fact that Japanese exports are concentrated in a number of high- and medium-high-technology sectors that generate substantial trade surpluses.

**Source**

• OECD, STAN Indicators Database, 2008 edition.

- Comparisons should be made with caution as for some countries like Belgium and the Netherlands re-exports and re-imports are included in the trade data. This can have as a consequence an overvaluation of their intra-industry trade.

**Box 9. The measurement of intra-industry trade**

Intra-industry trade flows are conventionally defined as the two-way exchange of goods within standard industrial classifications. The extent of intra-industry trade is commonly measured by Grubel-Lloyd indexes based on commodity group transactions. Thus, for any particular individual industries  $i$ , an index of the extent of intra-industry trade **in the industry  $i$  between two countries** is given by the following ratio:

$$[1] \quad IIT_i = \left( \frac{(Xi + Mi) - |Xi - Mi|}{(Xi + Mi)} \right) * 100 = \left( 1 - \frac{|Xi - Mi|}{(Xi + Mi)} \right) * 100$$

This index takes the minimum value of zero when there are no products in the same class that are both imported and exported, and the maximum value of 100 when all trade is intra-industry (in this case  $Xi$  is equal to  $Mi$ ).

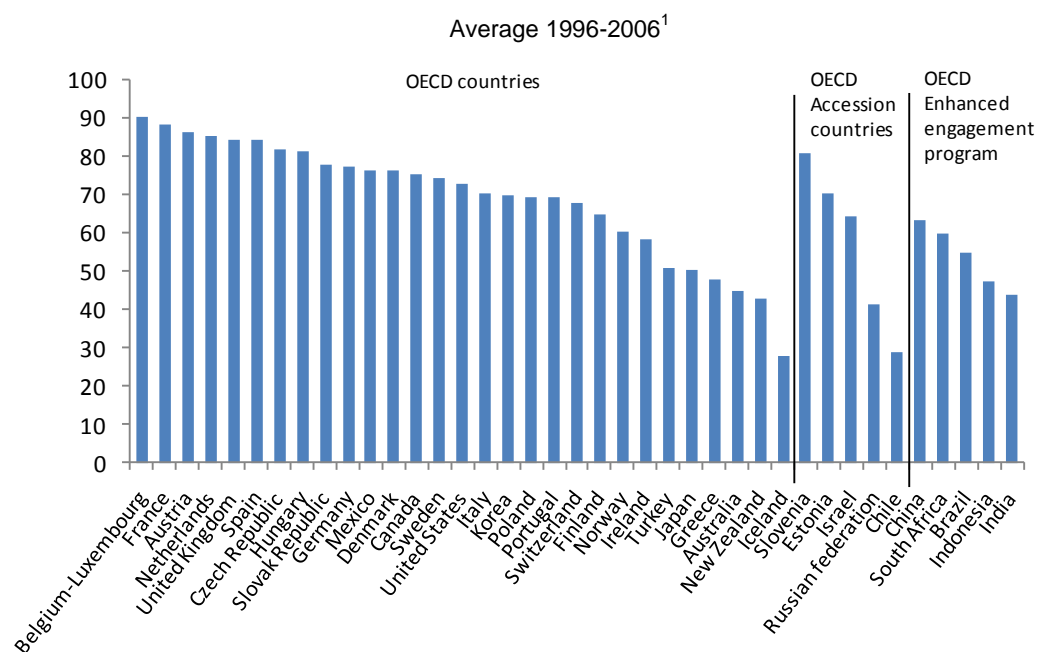
The index of intra-industry trade for total manufacturing **between two countries** can be calculated as a weighted average of the indices in [1] for **all industries  $i$** , with weights given by the share of total trade of  $i$  over total manufacturing trade:

$$[2] \quad \begin{aligned} IIT_{total \text{ manuf}} &= \sum_i \left[ \left( \frac{(Xi + Mi) - |Xi - Mi|}{(Xi + Mi)} \right) * \left( \frac{(Xi + Mi)}{\sum (Xi + Mi)} \right) \right] * 100 \\ &= \left[ 1 - \frac{\sum_i |X_i^k - M_i^k|}{\sum_i (X_i^k + M_i^k)} \right] * 100 \end{aligned}$$

The indicator presented hereafter (Figure I.9.1 and I.9.2) is based on the Grubel-Lloyd index. It shows for **each country with partner World the intra-industry trade for total manufacturing**, although a more sophisticated approach would be to take weighted averages over all partners as well as industries.

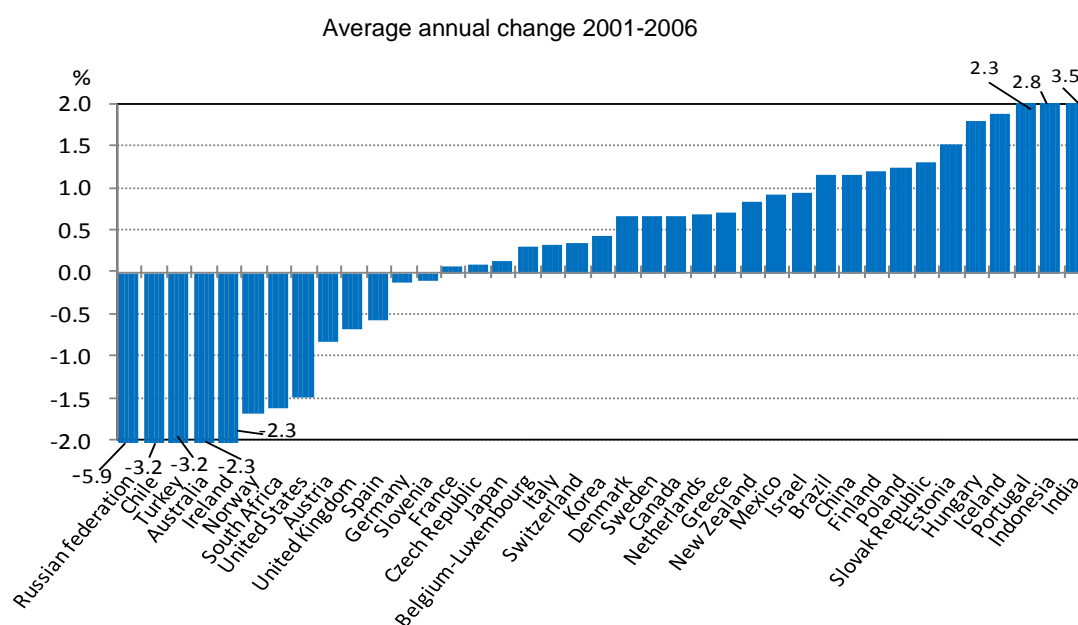
A degree of caution must be used when comparing and interpreting intra-industry indices because their measurement crucially depends on the level of disaggregation chosen for the analysis. In the current context of assessing the importance of the division of the production process across countries, it should be recognised that, as well as measuring trade in intermediate goods at various stages of production, much intra-industry trade concerns similar, but often highly differentiated finished products (OECD, Economic Outlook, June 2002, p.160). The limitations of the intra-industry trade indicators are presented in Measuring Globalisation: OECD Handbook on Economic Globalisation Indicators, Chap. 5, Section 5.3.5.

Figure I.9.1 Index of intra-industry trade in manufactures



1. 1997-2006 for the Slovak republic and 2000-2006 for South Africa.

Figure I.9.2 Index of intra-industry trade in manufactures





High tech products play a major role in merchandise trade. In 2006, the exports of high tech products represented a share of 11.2% of OECD's total merchandise exports. This is a decrease of 0.4 percentage points against 2000 (see figure I.10.1.). For most OECD countries, this share decreased, but especially for the United Kingdom there was a distinct increase.

The highest shares of high tech in total exports of the OECD were observed for the United Kingdom (21% in 2006, +6.3 percentage points against 2000), followed by Switzerland (20%, +2.3) and the United States (17%, -1.1). Within the OECD Accession Countries, it was Slovenia with the highest percentage (21%, +16.9), while this was the case for China and Hong Kong SAR (16%, +4.4) within the countries of the Enhanced Engagement Program of the OECD.

Figures I.10.2. to I.10.4 show the development of the trade of high tech products of the European Union (EU25), between 2000 and 2006, with some selected partner zones. While the trend of trade for these products was characterized by an increasing trade balance deficit of the EU25 with China and Hong Kong (SAR) between 2000 and 2006 (with the exception of 2002 when the balance was positive for the EU25), it was quite the opposite case for the trading partners India and Russian Federation. The trade balance of high tech products of the EU25 with India, in 2006, by example, was more than four times as high as it was in 2000.

The development of the merchandise trade of high tech products between Japan and China and Hong Kong (SAR) is covered by figure

I.10.5. In contrast to the situation of the EU25 (figure I.10.1.), Japan had a rather constant positive trade balance with China and Hong Kong SAR, between 2000 and 2006. While Japan's exports of this type of goods to these trading partners showed a distinct increase between 2001 and 2004 – followed by a more static phase –, Japan's imports remained rather constant if not slightly decreasing from 2000 to 2006, at a very low nominal level compared to the exports.

Figures I.10.6. and I.10.7. show the merchandise trade flows of high tech products of Korea, with partners China / Hong Kong SAR and India. While Korea's trade with China and Hong Kong was characterized by a rather stable surplus over all the period, its high tech trade with India quite exploded from 2003 onwards when the Korean trade balance for high tech with India was almost nine times as high as it was the case in 2002.

The US trade deficit in high tech products with China and Hong Kong SAR in 2006 was almost five times as high as in the year 2000. Both US exports and imports of this type of goods increased during this period, but while US exports of high tech products to China and Hong Kong SAR more than doubled, US high tech imports from this region more than tripled during this period.

**Source**

• Database: OECD ITCS Database, May 2008.

**Websites**

• OECD International Trade and Balance of Payments:  
[www.oecd.org/statistics/trade](http://www.oecd.org/statistics/trade)

• OECD Statistics: Globalisation:  
[www.oecd.org/statistics/globalisation](http://www.oecd.org/statistics/globalisation)

### **Box 9. High tech products**

The classification high tech by product consists solely of high-technology products (products which are the most technology-intensive). The classification was drawn up by the OECD Secretariat in collaboration with Eurostat, the object being to finalise the approach by sector and provide a more appropriate instrument for analysing international trade.

The product approach supplements the sectoral approach for high tech and opens the way to far more detailed analysis of trade and competitiveness. It differs in at least three ways from the sectoral approach.

While an industry may be very technology-intensive in one country and only slightly technology-intensive in another, it is inconceivable that the same product should be classified as high-tech in some countries and as medium- or low-tech in others. If that were the case, it would imply that the products were different. As a result, the existence of country lists alongside the OECD list can be justified only when, at national level, the list of high-tech products is much more disaggregated.

Second, the product approach includes some products which are not as a rule in the sectoral list since they are manufactured by medium-technology sectors. It also makes it possible to calculate the true proportion of high technology in a given sector, in the sense that the product approach excludes all products that are not high-tech, even if they are manufactured by high-tech industries.

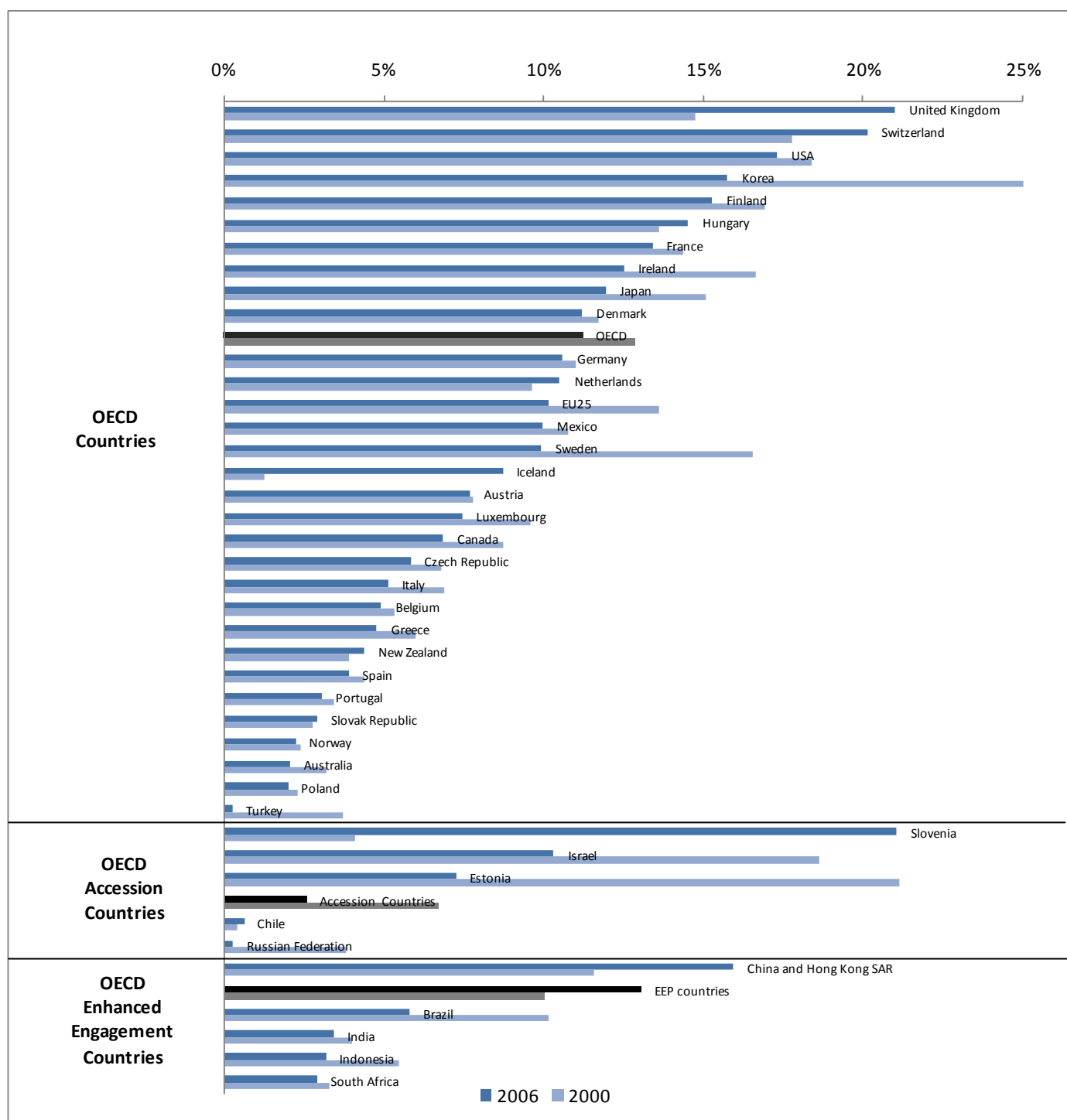
A third feature of the product approach is that it is solely concerned with products in the high-technology category. For the time being medium-high-, medium-low- and low-tech products are not identified, at least at the level of aggregation that has been selected.

An initial list was prepared by the OECD Secretariat in conjunction with the Fraunhofer Institute in Germany, corresponding to the three-digit SITC Rev. 3 classification of foreign trade. It was the outcome of calculations concerning R&D intensity by groups of products (R&D expenditure/total sales) covering six countries (the United States, Japan, Germany, Italy, Sweden, the Netherlands).

In the product approach, in contrast to the sectoral one, the number of countries covered is of no great importance since national considerations have no bearing on whether a product is classified as high-tech or not. Accordingly, for a given level of aggregation, a list of high-tech products can be drawn up on the basis of a smaller number of countries.

The list proposed by the OECD Secretariat in 1994 represented an important first step in this new field and served as the basis for subsequent work. Since 1994 the five-digit foreign trade classification SITC Rev. 3 has been replaced by the six-digit Harmonized System classification (252 HS 6-digit codes are currently allocated as high tech products).

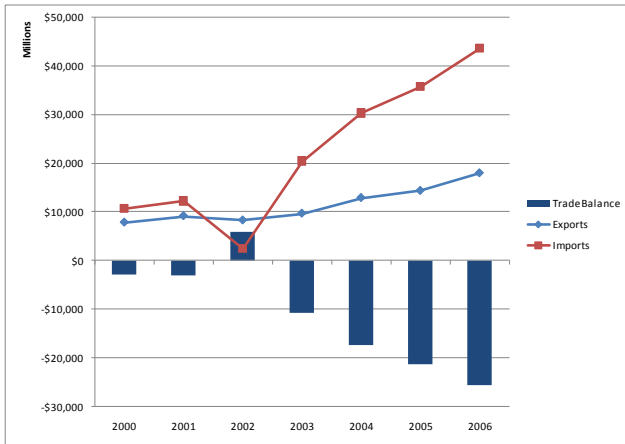
**Figure I.10.1. Trade of high tech products:**  
share of total trade, in %, 2000 and 2006  
Per cent, current prices



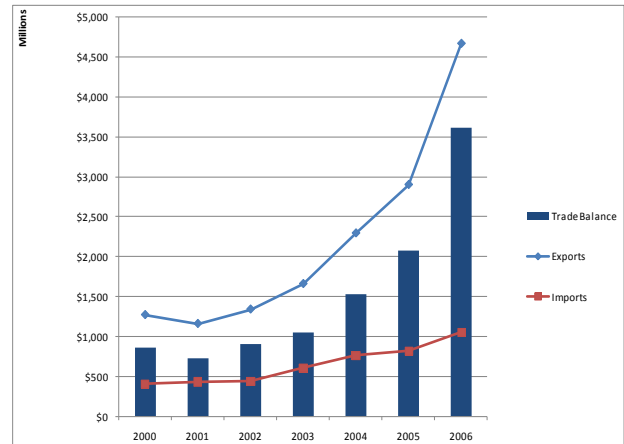
## ROLE OF HIGH-TECH IN MERCHANDISE TRADE

I.10.

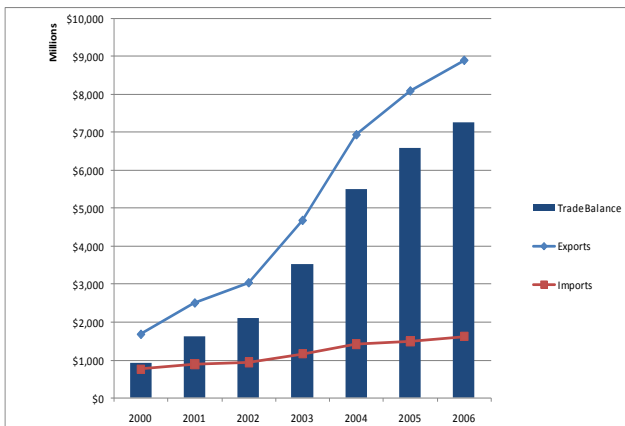
**Figure I.10.2. Trade of high tech products:  
EU25 and China / Hong Kong SAR**  
share of total trade, in %, 2000 and 2006



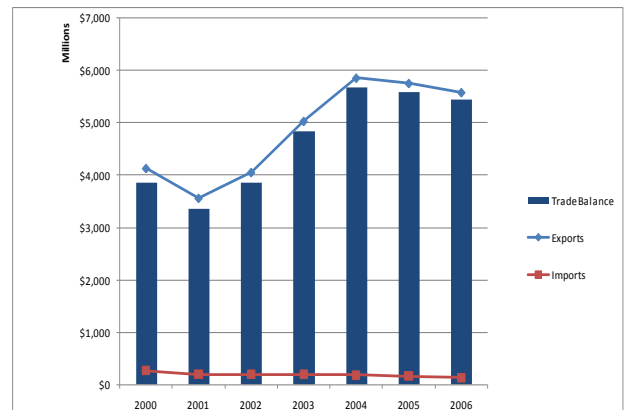
**Figure I.10.3. Trade of high tech products:  
EU25 and India**  
share of total trade, in %, 2000 and 2006



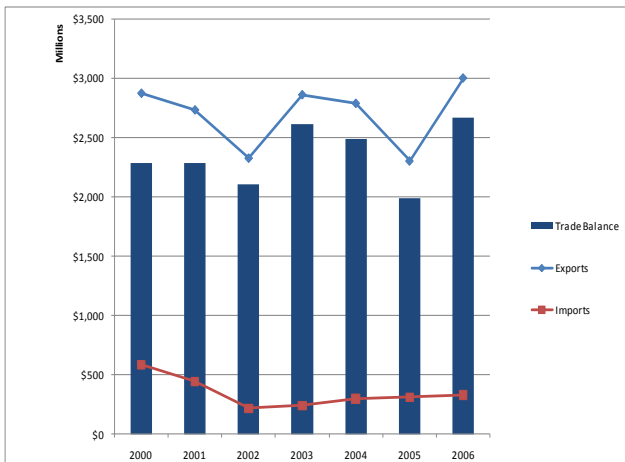
**Figure I.10.4. Trade of high tech products:  
EU25 and Russian Federation**  
share of total trade, in %, 2000 and 2006



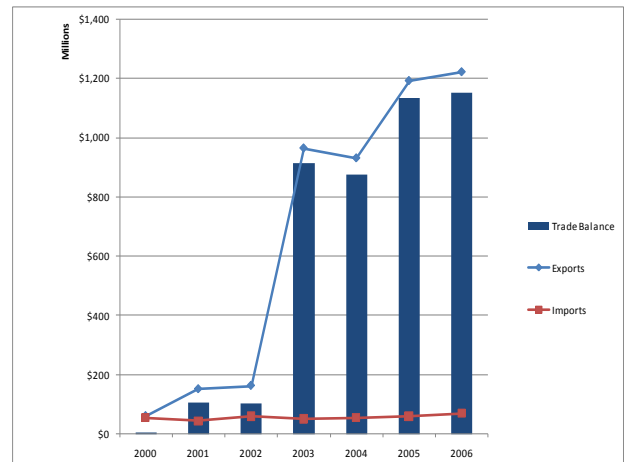
**Figure I.10.5. Trade of high tech products:  
Japan and China / Hong Kong SAR**  
share of total trade, in %, 2000 and 2006



**Figure I.10.6. Trade of high tech products:  
Korea and China / Hong Kong SAR**  
share of total trade, in %, 2000 and 2006



**Figure I.10.7. Trade of high tech products:  
Korea and India**  
share of total trade, in %, 2000 and 2006



**Sensitivity of trade flows to price changes** is measured through price elasticity. As Figures I.11.1 and I.11.2 show, for most OECD countries, price elasticity of both imports and exports are negative and inelastic for a period from 1970 to 2006. This means that, when price goes up, trade volume decreases but by less than the price increase. Mexico is the only country whose import is more sensitive to price change with an elasticity of -1.38. Although trade flows react insensitively to prices changes, relative sizes of the sensitivity vary significantly. For imports, price elasticities of eight countries are less than 0.2 in absolute terms and those of seven countries are bigger than 0.4 in absolute terms. Furthermore, export elasticities of two countries are less than 0.2 and those of ten countries are bigger than 0.4.

**Sensitivity of trade flows to income changes** is measured by income elasticity. For all OECD countries both import and export are very sensitive to changes in domestic and external income, respectively. Figures I.11.3 and I.11.4 show income elasticities of imports and exports ranging between 1.5 and 4, with import elasticity being more uniform across countries. For a majority (2/3) of OECD countries, import income elasticities are higher than those of export. Exceptions are for eight countries, including Ireland, Korea, Luxembourg, and Turkey, which show significantly higher income elasticities of export.

**Trade sensitivities to income and economic growth** were observed for 1970-2006 through the relationship between relative growth of domestic economy to the world and the ratio between export and import elasticities of income.

Figure I.11.5 shows the results that a majority of OECD countries have grown slower than the world average and their imports are more sensitive to domestic demand than their exports [Quadrant I]. Six countries in Quadrant III, e.g. Korea and Ireland, exhibit completely opposite patterns with higher domestic growth and more sensitive export. Three countries in Quadrant IV, i.e. Iceland, Spain and Mexico, grew faster than the world with more sensitive import. Finally, in Finland and Portugal, domestic growth rates are lower than the world but imports are more sensitive. Additionally, when growth rates of imports are higher than those of exports, countries are located in the upper part of the diagonal line. For example, imports grew faster than exports in Mexico and Italy from 1970 to 2006.

**Dynamics of income elasticities of trade flows** were further investigated by means of recursive models, i.e. serially adding one more year to the initial time frame (1970-1995) up to 2006. Figure I.11.6 shows income elasticities for bigger and smaller economies. Sensitivity of trade flows to income changes varies significantly with the number of years included in the model. The results are more volatile for periods up to 2000, and become more stable and converging when the model includes data for the following periods. This result seems to be coherent with the dynamics of globalization in other domains.

#### Source

- Database: OECD Annual National Account database
- External data resource: World Development Indicators database of World Bank

#### Box 11. Trade Elasticity

Trade elasticity reveals the impact of changes in internal or external conditions on volume of imports and exports or terms of trade. They are calculated as a ratio of % change in quantity (import or export) to % change in price or income. If the elasticity of external demand price is low, for example, changes in external conditions or changes in exchange rates are unlikely to have much impact on the current accounts or the growth of an economy. In addition to the size, stability of the elasticity is also important to look at. If they are unstable, the effect of such changes on the economic movement cannot be determined with any degree of confidence.

OECD's National Account database was used to extract data on imports and exports (both volume and value) and total Gross National Income (GNI) for each OECD member country. Imports and exports include both goods and services. World Development Indicators database was used to collect data on world GNI. All the information is in annual frequency for 1970-2006 and valued in US dollars. The import and export prices are estimated as a ratio between imports and exports at current and constant prices, respectively. Eastern European OECD Member countries, i.e. Czech Republic, Hungary, Poland and Slovak Republic, are excluded from the analysis due to the shorter length of their time series. Basic equations utilized to estimate import and export elasticity are as follows:

$$M_t = F [M_{t-1}, DD_t, P_{m,t}] , \text{ where } M_t \text{ is imports, } DD_t \text{ is domestic income and } P_{m,t} \text{ is import price; and}$$
$$X_t = F [X_{t-1}, DW_t, P_{x,t}] , \text{ where } X_t \text{ is exports, } DW_t \text{ is external income and } P_{x,t} \text{ is export price.}$$

A Generalized Least Square model was used to estimate import (export) elasticity, with lagged import (export), import (export) prices and domestic (external) income as explanatory variables. Volume data were used for both imports and exports and domestic and external income. Size of elasticities of imports and exports seem to be very sensitive to inclusion or exclusion of lagged dependent variables or trend..

## I.11. SENSITIVITY OF TRADE FLOWS TO PRICE AND INCOME CHANGES

Figure I.11.1 Import Price Elasticity (1970-2006)

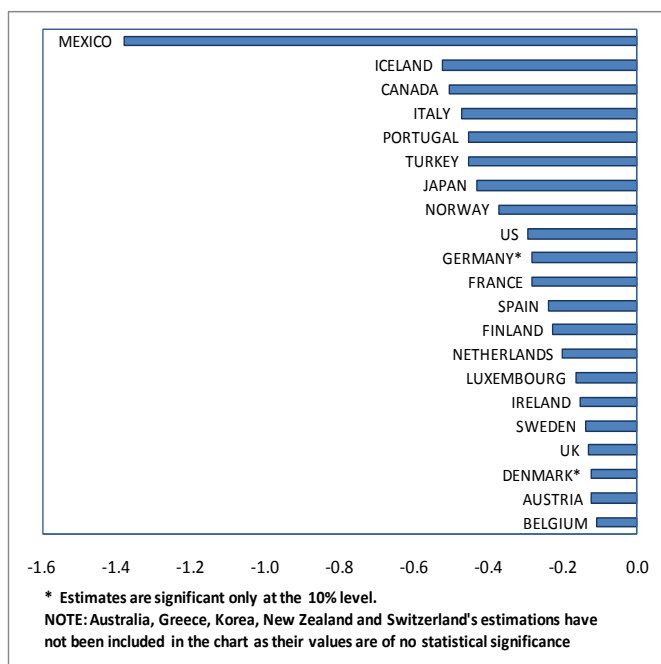


Figure I.11.2 Export Price Elasticity (1970-2006)

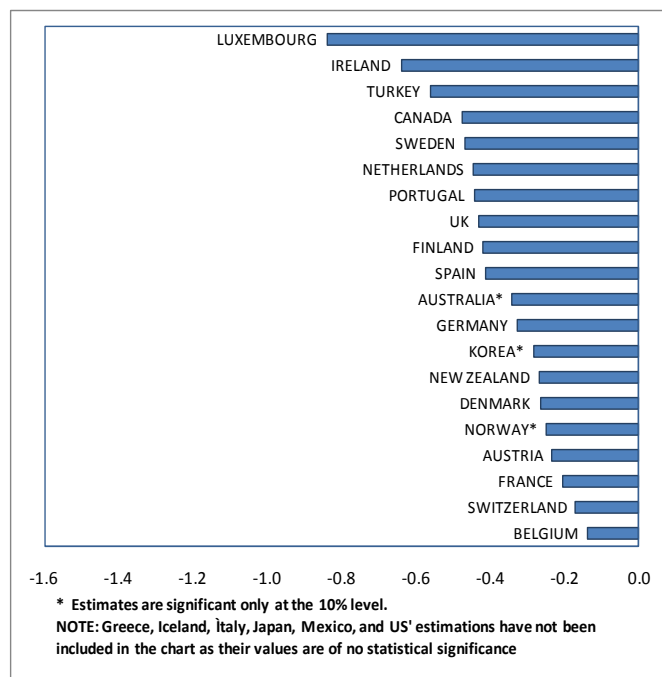


Figure I.11.3 Import Income Elasticity (1970-2006)

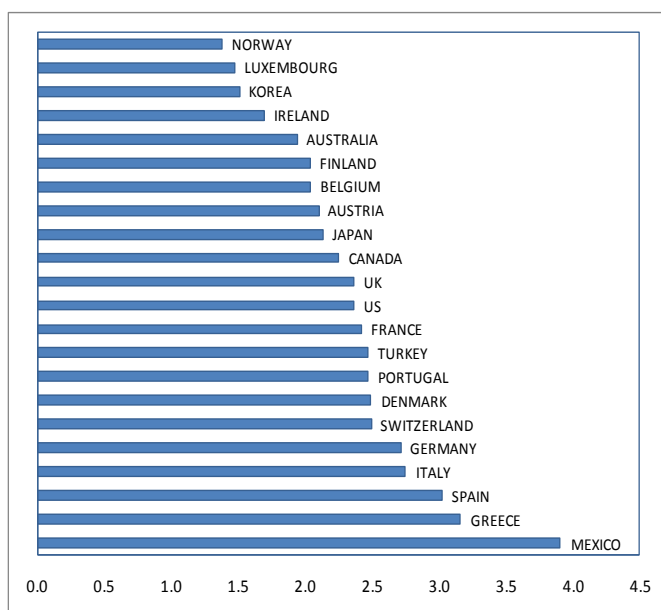
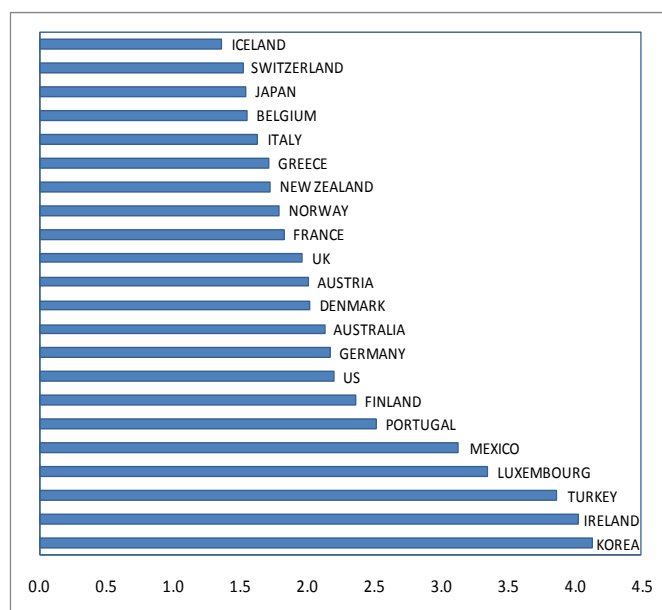


Figure I.11.4 Export Income Elasticity (1970-2006)



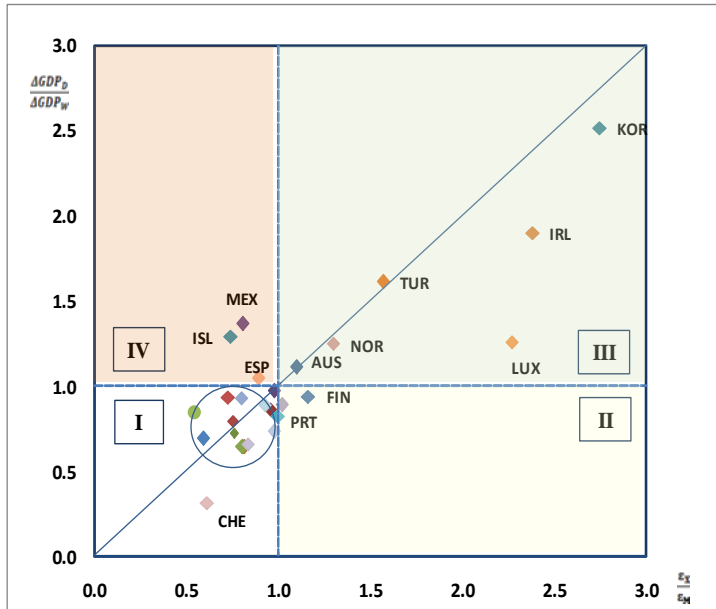


Figure I.11.5 Growth rates of national to world income and income elasticities of export to import (1970-2006)

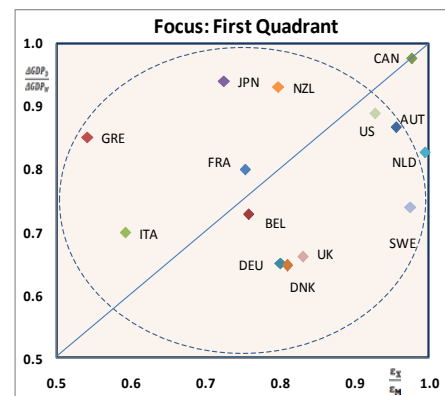
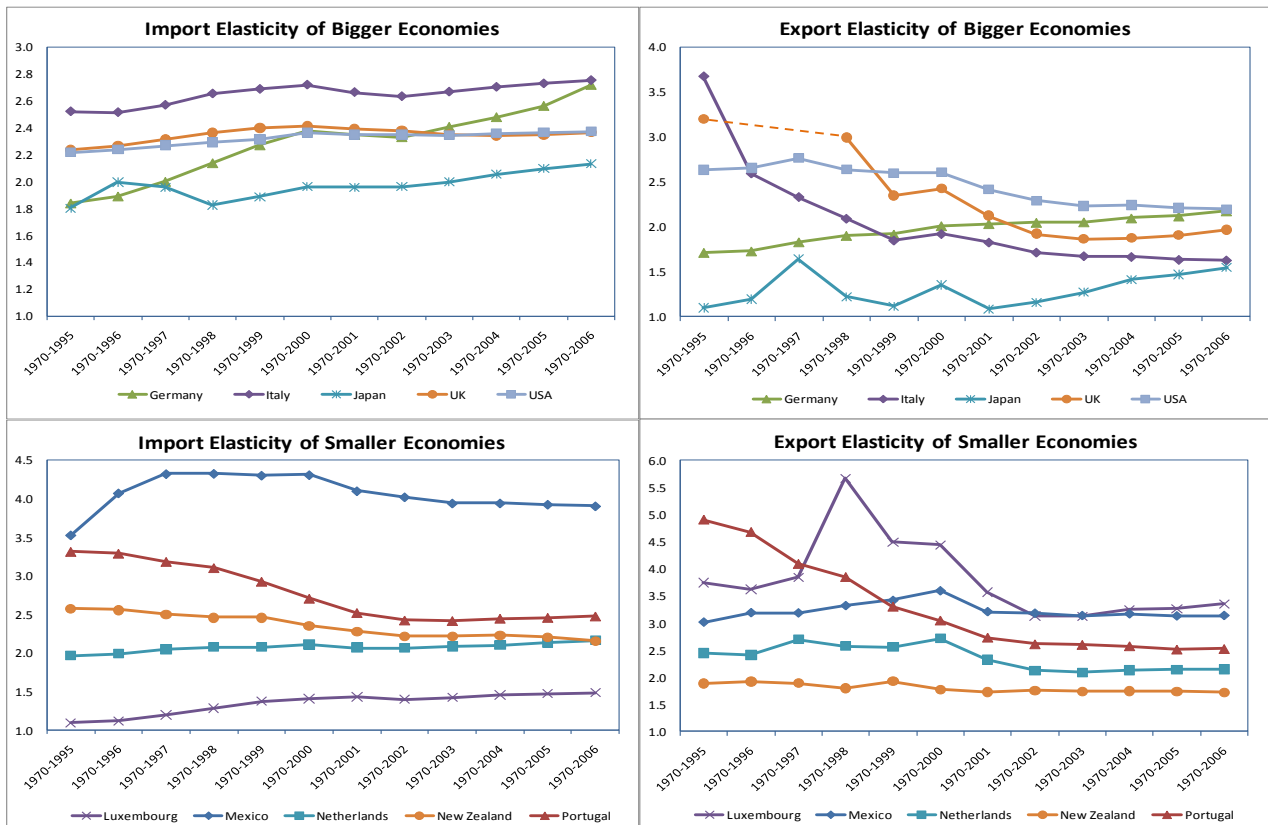


Figure I.11.6 Dynamics of income elasticities of trade flows (1970-2006)



Note: Dotted lines are a graphic replacement of unrealistic or not statistically significant estimates



