

Conference proceedings

**“GLOBALIZATION OF  
INDUSTRIAL PRODUCTION CHAINS  
AND MEASUREMENT OF TRADE  
IN VALUE ADDED”**



Paris, 15 October 2010



WTO OMC

Measuring international trade in value added  
for a clearer view of globalization



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The idea for the Conference came from Jean Arthuis, Chairman of the Senate Finance Commission, and Pascal Lamy, Director-General of the WTO. The event was coordinated by David Bonnet, Chief Administrator of the Senate Finance Commission, and Hubert Escaith, Chief Statistician at the WTO.

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## Disclaimer

The views expressed in this document are the sole responsibility of the participants in the Conference on “Globalization of Industrial Production Chains and Measurement of International Trade in Value Added” and the Conference Rapporteur. They do not necessarily reflect the opinions or views of the Senate Finance Commission or of WTO Members. The terms used and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Senate Finance Commission or the WTO concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

# I. Introduction and Conference programme

*“When the needs of economic and social policy change, statistics must follow along”*

*Pascal Lamy*

*“It is healthy, and vital even, for politicians too to concern themselves with technical matters”*

*Jean Arthuis*

Changes in international trade: globalization and fragmentation of production

The last 20 years have seen an ever increasing number of changes in international trade as a result of the continuing effects of globalization:

- *Historical circumstances have played an important role, most notably the end of the cold war and the break-up of the Soviet bloc, which helped not only to generalize the free trade model but to increase further the number of States and therefore potential trading partners. This number had already been sharply augmented by the decolonization process in the years 1950 to 1970.*
- *The trend towards regional integration, with the conclusion of the Single Act of 1986 and the increase in regional free trade agreements (NAFTA, MERCOSUR, ASEAN, etc.), has encouraged States to trade more with their neighbours near and far.*
- *The establishment of the World Trade Organization (WTO) under the 1994 Marrakesh Agreement also signalled a common desire to liberalize trade.*
- *Changes in international trading conditions are, however, brought about primarily by rapid technological developments in the area of information and communication technology.*

These various factors have helped to bring down trading costs, thanks to reduced customs tariffs, the improved price/quality ratio of international transport, and, in particular, technological advances in information and communication. This fall in trading costs has had a direct impact on production processes at company level. The volume of trade in intermediate goods (components and subparts of unfinished products) has risen sharply in recent decades, and the offshoring of goods and even services has accelerated - this is referred to as production fragmentation, or vertical specialization of production. The offshoring of these stages gives extra strength to truly global production chains.

## **Matching new phenomena to new economic and statistical models**

The speed of these changes has taken analysts by surprise: the traditional view of goods-based trade between nations has now been complemented by a new theory that seeks to explain the trend in international specialization based on trade in tasks.

The growing internationalization of industrial production and the increasing power of emerging economies have resulted in the development of two-way trade, very often within the framework of intra-industry trade or subcontracting agreements. The traditional method of recording such trade on the basis of its commercial value measured at the border leads to a certain amount of statistical distortion (in particular an overvaluation of the economic quantities actually involved). In such circumstances, the traditional instruments of economic statistics are losing their relevance.

The notion of ‘country of origin’, something carefully recorded by customs authorities, is in particular losing much of its significance, since the total commercial value of a product is attributed to the country in which it last underwent processing, regardless of its relative contribution to the value-added chain. As a result, the study of bilateral trade balances is becoming less relevant.

The speed at which international trade practices are changing puts to the test the international statistical system’s ability to adapt. This system has responded to the evident risk of obsolescence by launching a series of joint initiatives to ensure the simultaneous adaptation of all the instruments in the international statistician’s “tool box”: nomenclatures, balance-of-payments manual and system of national accounts. The challenge is to monitor value added at each stage of the production chain, so as to re-establish the truth about trade by weighing it in terms of the real contribution made by each trading partner.

## **Developing a means of measuring international trade in value added**

The idea for the Conference held in the French Senate on 15 October 2010 on “Measuring international trade in value added for a clearer view of globalization” came from Mr Jean Arthuis, Chairman of the Senate Finance Commission, and Mr Pascal Lamy, Director-General of the WTO. The purpose of the event was to review the problems associated with taking account of value added in the measurement of trade.

Mr Jean Arthuis, who opened the Conference, believes that politicians should pay more attention to matters that are considered technical. Subjects such as financial regulation, accounting standards and prudential ratios,

long the preserve of technicians and experts, should also interest politicians, who are the ones citizens turn to for answers when problems arise. Elected representatives are responsible not only for establishing a framework and rules but for repairing any damage caused. However, since politicians are not experts, they must be able to rely on a clear depiction of the true state of affairs in order to make decisions.

Moreover, foreign trade figures are themselves open to question. Global development and evolving industrial processes have given rise to considerable biases that can distort our view of reality. Instead of measuring gross flows, statistics should reflect value-added flows between States. Behind this seemingly technical debate, it is our view of globalization that is at stake. Public opinion is formed on the basis of simplistic data, which poses a political problem and a problem of democracy.

Mr Pascal Lamy, who took the floor following Mr Arthuis's introduction, believes that public affairs and official statistics have long been good bedfellows. Statistical production evolved in step with changing needs in an economy that became increasingly complex following the industrial revolution and the advent of the service society. In return, statistics correct the perception and the interpretation of economic and social phenomena. The fact that statistics relies on analytical progress to improve its figures and is used by political decision-makers to guide their choices enhances the public debate.

Today, the notions underlying trade statistics must be viewed differently. The notion of "country of origin" for manufactured goods has gradually become obsolete with the development of international production chains. More and more products are "Made in the World" rather than "Made in the UK" or "Made in France". The notion of "relocation", which made sense in the past when referring to the production of a good or service at a single location, has lost much of its meaning, as the value chain has now become multi-located, from the design stage through to the manufacture of a product.

If we continue to base our economic policy decisions on incomplete statistics, our analyses could be flawed and lead us to the wrong solutions. When new phenomena are measured using old methods, paradoxes and misunderstandings arise. Mr Lamy therefore considers that the time has come to explore new channels so that accounting and statistical systems can take account of the new geography of international trade. This must take place not through deconstruction, but through the reorganization of the international statistical system - a link must be forged between the various existing, and yet separate, statistical subsectors.

The purpose of the Conference held on 15 October 2010 was, in the words of Mr Lamy, to reflect on "the right statistical bridges between the different national accounting systems" in order to provide a clearer view of the reality of globalization and promote sound decision-making by politicians. The guest speakers provided answers to the following questions, summarized by Mr Arthuis:

- Is the reasoning on value added sound, or does such reasoning itself involve bias?
- What are the methodological challenges of changing from one counting method to another?
- If this is the right approach, what sort of time-frame should be envisaged for developing tools at national, European and world level?

The first part of the Conference, entitled "International and French experience", was devoted to the presentation of research results showing how a value-added approach to trade can re-establish the truth about the globalization of trade and production, and to the description of methodological advances already made or still required in this area.

The second part, entitled "Statistical and economic implications of globalization", looked at how a value-added approach is useful for understanding a broad range of economic issues, and also provided an opportunity, in the context of a concluding round table, to examine the practical issues and challenges of this approach for States.

## Conference work programme

### 1. Morning

#### **9.30 - 10.15 a.m.**

##### **Opening of Conference and introduction**

Mr Jean Arthuis, Chairman of the Senate Finance Commission, and Mr Pascal Lamy, Director-General of the World Trade Organization.

#### **10.30 a.m. - 12.30 p.m.**

##### **International and French experience**

Moderator: Mr Patrick Artus (Natixis, member of the Council of Economic Analysis)

- I. Presentation of the panel and its objectives
- II. The international integration of industrial processes and trade in intermediate goods: the experience of the OECD countries (Mr Sébastien Miroudot, OECD)
- III. The international integration of industrial processes: the German experience (Ms Dalia Marin, Munich University)
- IV. France's foreign trade measured in value added (Mr Guillaume Daudin, Ms Christine Riffart and Ms Danielle Schweisguth, OFCE)
- V. Measuring trade in value added: methodological options and current experiences (Mr Andreas Maurer, WTO)

### 2. Afternoon

#### **2.30 - 4.15 p.m.**

##### **Statistical and economic implications of globalization**

Moderator: Mr Jean Pisani-Ferry (Bruegel, member of the Council of Economic Analysis)

- I. Presentation of the panel and its objectives
- II. The role of international production chains in the transformation of production in developing countries: the Asian example (Mr Hubert Escaith, WTO)
- III. The role of outsourcing, technical progress, and competitiveness in the development of industrial employment in France (Ms Lilas Demmou, Université Paris VIII, formerly at the Directorate-General of the Treasury)
- IV. Methodological options for the measurement of trade in value added; its additional contribution in terms of globalization, competitiveness and economic sustainability to the road map proposed by the Stiglitz-Fitoussi Commission (Mr Jean-Philippe Cotis, INSEE)

#### **4.30 - 5.15 p.m.**

**The measurement of France's foreign trade and globalization: presentation of the challenges and issues, followed by a round table discussion**  
(Mr Jean Pisani-Ferry)

#### **5.15 - 5.30 p.m.**

**Conclusions (Mr Jean Arthuis)**

## II. International and French experience: examples and paradoxes brought to light by measuring international trade in value added

### Introduction

The main purpose of the first part of the Conference, “International and French experience”, was to show, through various research results, how measuring international trade in value added makes it possible to correct, sometimes quite dramatically, the traditional statistical view of industrial processes and international trade. Traditional measuring tools were not designed to describe the new fragmented production and trade structures which now characterize the large globalized economies. And if those statistical tools give a partially distorted view of economic reality, the political classes are prevented from making properly informed decisions.

At the morning session, economists, statisticians and academics with a shared interest in the benefits of a value-added approach to trade, were given the opportunity to:

- share the results of their research, which often run counter to certain received or a priori ideas; and
- discuss various possible methodologies from a purely statistical standpoint with a view to measuring trade in value added.

Mr Patrick Artus, Head of Economic Research at Natixis and member of the Council of Economic Analysis, acted as moderator for the presentations and accompanying question and answer sessions. By way of introduction, and following on from Mr Lamy’s speech, Mr Artus wished to highlight some further examples of analytical errors that may arise from the use of statistics not adapted to new production processes and trade structures. The mistake is to confuse the apparent value of world trade in terms of production and trading transactions and the domestic value added integrated into trade. If the segmentation and overlapping of production processes are not taken into account, such confusion can affect many areas of economic analysis.

- *Chinese growth.* A common error is to base Chinese growth primarily on the development of world trade. However, on closer inspection of the import content of China’s exports, it becomes clear that China’s level of openness is fairly low and similar to that of Europe. The development of domestic demand, and in particular investment, is therefore far more important to Chinese growth. This is also illustrated by the fact that the Chinese Government’s priority is to increase domestic consumption.
- *Measuring competitiveness.* Traditional measurements of competitiveness can be biased if no precautions are taken. Where outsourcing and offshoring are frequent, measuring unit wage costs gives only an approximate idea of the country’s

real cost-competitiveness, which also depends on the cost of products that have been manufactured abroad and reimported into the country. In Germany, where foreign outsourcing is widely practised, competitiveness gains are hidden and do not appear in national statistics. Such an error results in distorted comparisons between France and Germany.

- *Measuring comparative advantages.* Where the comparative advantages of States are measured on the basis of export structure, the error is substantial. The upgrading of China in the range of its exports, for example, should be analysed with great care: where an increase in the extensive margin is effectively observed in absolute terms, a drop in the range of domestic contents is observed in relative terms, due to the higher level of the import content of these exports.
- *Protectionism.* In an environment where flows and production processes are interlinked, it is wrong to view protectionism as a useful weapon. A large proportion of US imports from China are in fact imports of products of US companies assembled in China. Increasing customs tariffs would have a catastrophic impact on these US companies.
- *Exchange rates.* Overlapping and highly fragmented production processes at global level generate exchange rate variability and the resulting instability has a considerable impact on economies. This promotes the desire for exchange rate stability. In Asia, the most stable exchange system would be one where each country stabilized its own effective exchange rate, taking into account its exchange structure.
- *Economic cycles.* The overlapping of production processes gives rise to highly interdependent cycles. This is particularly noticeable in Asia.
- The various presentations that followed Mr Artus’s introduction contributed further to correcting the traditional analysis of industrial processes and foreign trade. The morning was divided into three main segments.
  - First, **Mr Sébastien Miroudot**, Economist at the OECD Trade Directorate, presented, characterized and assessed the phenomena of the international integration of industrial processes and trade in intermediate goods in the OECD countries.
  - Two countries, Germany and France, were then examined in greater detail, highlighting the relevance of the trade in value added approach:
    - **Ms Dalia Marin**, Professor at Munich University, discussed the new division of labour between

Germany and Central and Eastern European countries;

- **Mr Guillaume Daudin**, Professor of Economics at the University of Lille I and Research Associate at the French Economic Observatory (OFCE), **Ms Christine Riffart**, Senior Economist at the OFCE, and **Ms Danielle Schweisguth**, OFCE Economist, presented their research results with a view to assessing France's real position in international trade.

- Finally, **Mr Andreas Maurer**, Chief of the International Trade Statistics Section in the WTO Economic Research and Statistics Division, looked at methods that might eventually be used to measure trade effectively and efficiently in value-added terms.

## A. The International Integration of Industrial Processes

In his presentation, Mr Sébastien Miroudot, Economist at the OECD Trade Directorate, sought to illustrate the international integration of industrial processes and the increase in trade flows of intermediate goods in OECD countries.

### Understanding companies' supply strategies in respect of intermediate goods

To understand fully the importance of measuring trade in value added, one needs to look at intermediate consumption and in particular at imported intermediate goods. Intermediate goods are those which are used to produce other goods. Trade in intermediate goods is particularly developed in the context of production fragmentation and vertical specialization, i.e. the division of labour at international level. The logic is identical to that of Adam Smith's "pin factory" (see box). Smith argued that by entrusting production tasks to different employees, productivity could be significantly increased. Nowadays, labour is divided at world level, with tasks distributed among different countries.

Two recent examples of production fragmentation and vertical specialization are the following:

- In Thailand, the manufacture of a hard disk, an intermediate good used in computer production, involves components and parts from more than ten Asian and American countries. Each country specializes in one or more types of component. This leads to highly sophisticated component networks.
- Asia and China are not the only countries affected by these phenomena. The example of the Boeing 787 Dragline is representative of the situation in OECD countries. Despite being a US aeroplane

### Adam Smith (1723-1790), extract from "An Inquiry into the Nature and Causes of the Wealth of Nations", 1776

"To take an example, therefore, from a very trifling manufacture; but one in which the division of labour has been very often taken notice of, the trade of the pin-maker; a workman not educated to this business (which the division of labour has rendered a distinct trade), nor acquainted with the use of the machinery employed in it (to the invention of which the same division of labour has probably given occasion), could scarce, perhaps, with his utmost industry, make one pin in a day, and certainly could not make twenty. But in the way in which this business is now carried on, not only the whole work is a peculiar trade, but it is divided into a number of branches, of which the greater part are likewise peculiar trades. [...]

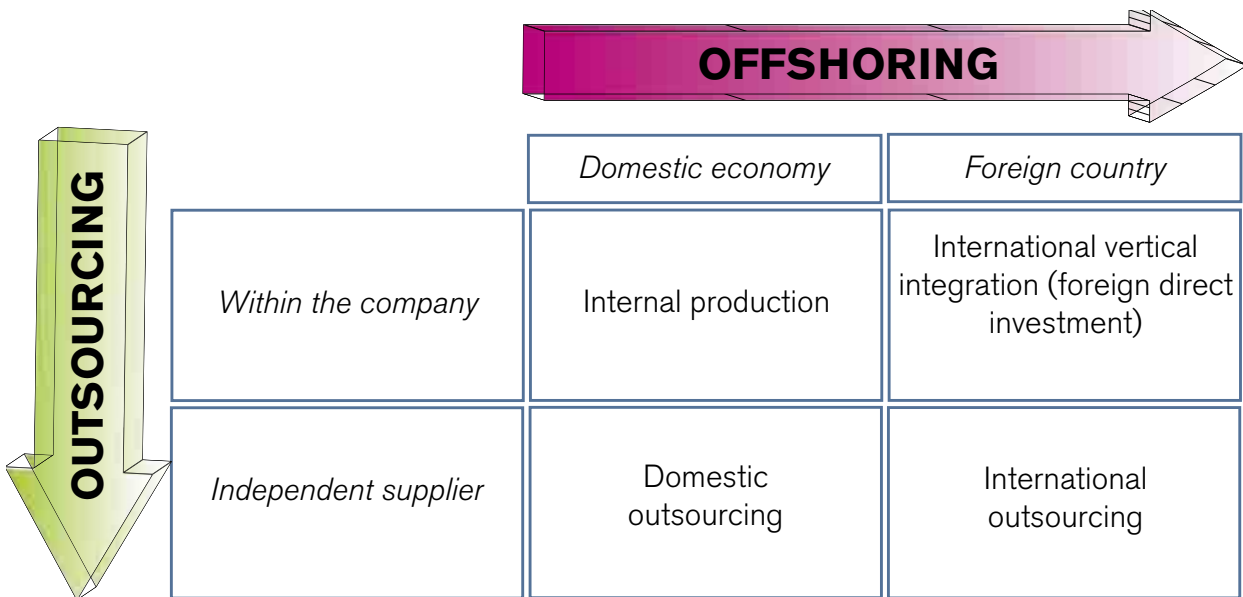
In every other art and manufacture, the effects of the division of labour are similar to what they are in this very trifling one; though, in many of them, the labour can neither be so much subdivided, nor reduced to so great a simplicity of operation. The division of labour, however, so far as it can be introduced, occasions, in every art, a proportionable increase of the productive powers of labour. The separation of different trades and employments from one another seems to have taken place in consequence of this advantage."

manufactured by Boeing, its parts and components come from a long list of international suppliers (wings and front fuselage from Japan; central fuselage from Italy; engines from the United Kingdom; brakes and electrical and IT equipment from France, etc.).

In these two examples, companies have applied an international outsourcing strategy whereby independent foreign suppliers provide them with the intermediate goods they need. However, this is not the only input supply channel. Companies may choose different supply strategies, either international or national (see table):



## General offshoring and outsourcing strategies used by companies



- At national level, a company can manufacture its inputs internally, but may also choose to outsource, i.e. to buy its inputs from an independent domestic supplier;
- At international level, a company may choose a strategy of vertical integration through foreign direct investment, with inputs being manufactured by a subsidiary in another country. It may also decide to buy its inputs from an independent foreign company: this is known as international outsourcing.

Both cases involve offshoring.

When measuring trade in value added it is important to understand what determines companies' international supply strategies.

### Measuring vertical specialization-based trade

Looking at the level of vertical trade, or vertical specialization-based trade, makes it possible to assess the role of offshoring strategy in corporate behaviour. To define vertical trade, let us take the example of an end product manufactured in country 2 using an intermediate good produced in country 1. This end product is then exported to country 3. Vertical specialization-based trade therefore involves the export of intermediate goods from country 1 to country 2 and the export of the end product from country 2 to country 3. Both transactions must exist for trade to be classified as vertical.

Vertical trade can be measured by looking at the import content of exports, i.e. the share of imported inputs in the total amount of inputs used to produce one exported unit of a product. In the OECD area, this content increased

significantly and steadily between 1995 and 2005, rising from 24 to 32 per cent, which empirically illustrates the impact of production fragmentation on world trade.

At sectoral level, calculations show that:

Some sectors have engaged more actively in vertical specialization than others. The automotive, telecommunications, computer and oil sectors are those most concerned by this process, as is shown by the high import content of their exports.

- These same sectors saw the sharpest increase in the import content of exports between 1995 and 2005.
- An increase has, however, been noted in all sectors, including financial and business services.
- Measuring trade in intermediate goods and services

To measure trade in intermediate goods, Mr Miroudot chose to use data presented according to classification by broad economic category (BEC). This classification breaks down foreign trade data into categories based on the use of traded products (i.e. intermediate goods, end products, durable goods or capital goods). The method involves goods categorization choices that are sometimes inappropriate (a computer, for instance, may in reality be used as a durable good or as an intermediate good). However, supplemented by the use of national input-output tables (for services), this method provides a good estimate of the major trends in trade in intermediate goods and services.

The data show very strong growth in trade in intermediate goods in OECD countries, with such trade rising from

Source: Sébastien Miroubot.

a base of 100 in 1999 to more than 200 in 2008. A significant drop, linked to the financial crisis, was nevertheless observed in 2009. Among intermediate goods, a distinction can be drawn between raw materials and processed goods. Processed goods account for 90 per cent of the value of trade in intermediate goods and services; however, between 1999 and 2009, trade in raw materials grew faster than trade in processed goods (partly due to a price effect, given the unprecedented rise in the prices of raw materials over the course of the decade).

Most global trade in goods (excluding raw materials), i.e. around 60 per cent, consists of trade in intermediate goods. This figure rises to 70 per cent for trade in services. These proportions have varied only slightly over the last 15 years. In fact, together with the internationalization of production and consequent increase in trade in intermediate goods, we have also witnessed the internationalization of consumption, i.e. a wider variety of goods traded with a view to final consumption. As a result, the share of intermediate trade has remained stable.

This stability is partly due to companies making so-called complex investments. It has been noted that horizontal investment often goes hand in hand with vertical investment. When a company creates a subsidiary to produce an input, it is also going to be interested in the

local market, which it will try to conquer through this new subsidiary or by creating another one. Thus, while offshoring its input production, a company seeks to reach new consumers and internationalize its sales of finished products. The consumption of intermediate products increases in step with the consumption of end products.

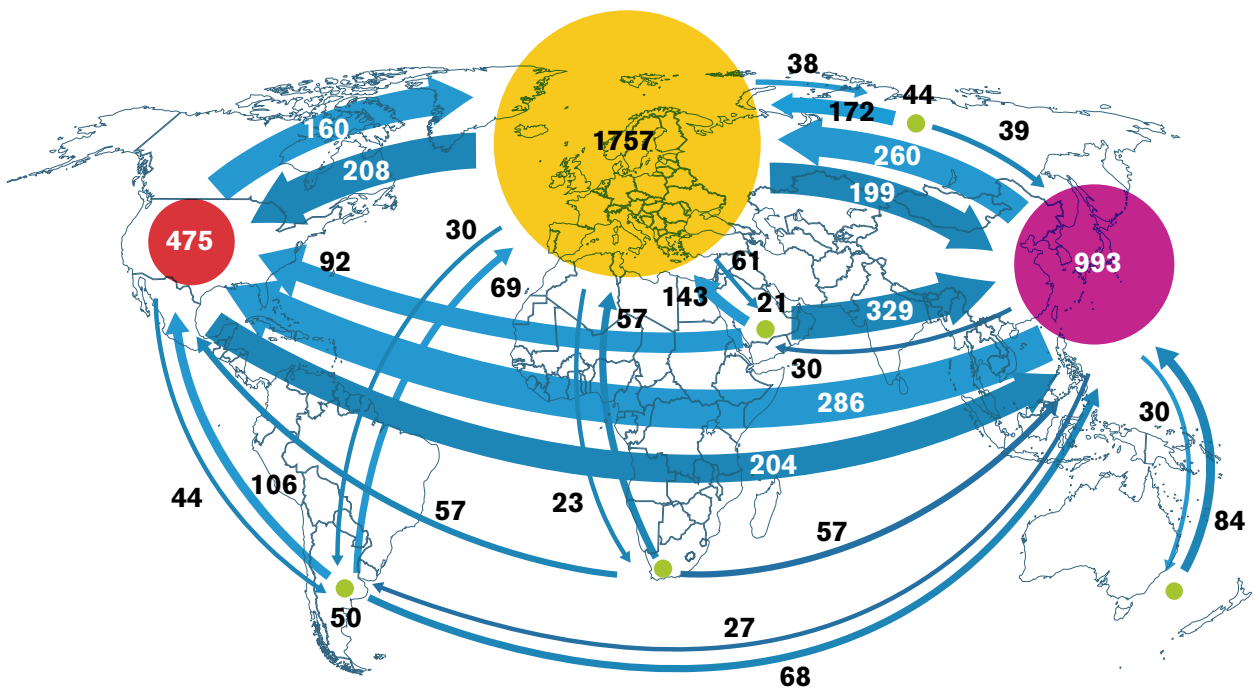
### Determining the geography of trade in intermediate goods

Most of the trade in intermediate goods takes place within three main regions: North America, Europe and Japan (see map). It is also noted that intra-regional flows are greater than inter-regional flows, and that Africa and South America are marginalized.

These three regions account for a considerable share of imports of intermediate goods. However, each region has its own areas of specialization. Asia specializes in imports of precision, optical and telecommunications instruments and computers, while North America's focus is on motor vehicles. Europe imports a relatively wide range of intermediate goods.

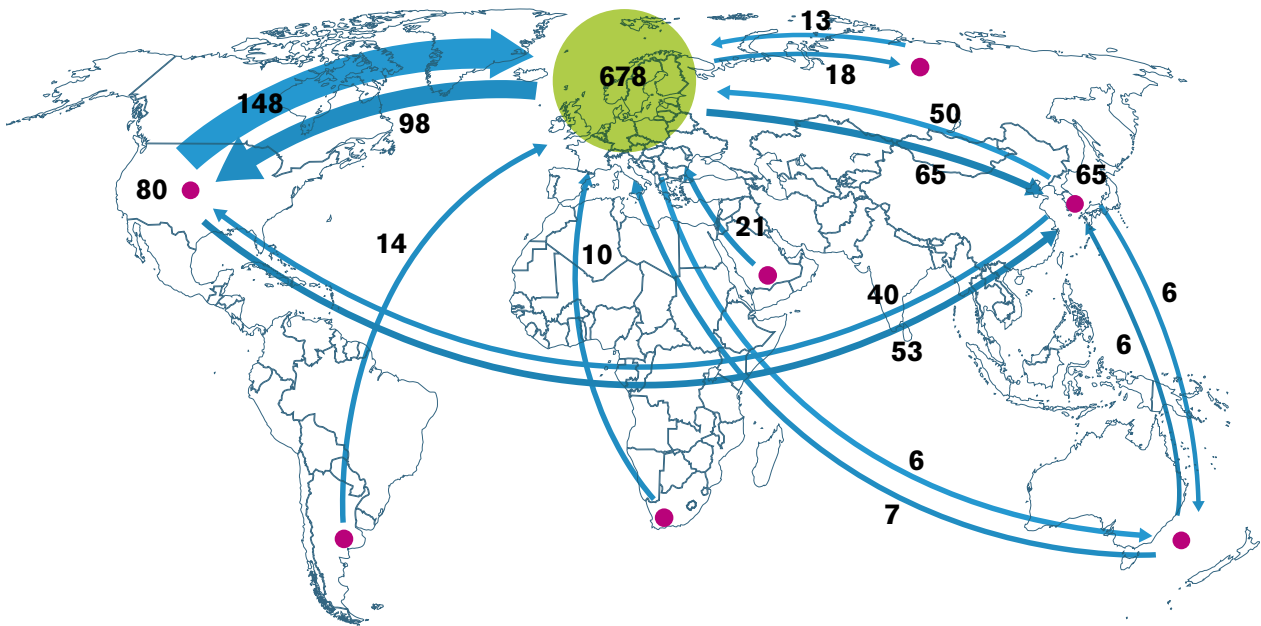
The three regions also have areas of specialization in respect of exports of intermediate goods. Asia is a major exporter of office machines and textiles, while Europe specializes mainly in exports of mechanical products.

**Intra-regional and inter-regional flows of intermediate goods (imports in billions of dollars, 2006)**



Source: Miroudot, Lanz and Ragoussis (2009). Includes intra-European Union trade.

## Intra-regional and inter-regional flows of intermediate services (imports in billions of dollars, 2006)



Source: Miroudot, Lanz and Ragoussis (2009). Includes intra-European Union trade.

Europe's most marked area of specialization is, however, intermediate services. Europe accounts for the majority of intermediate services imports and exports, even if intra-European Union trade is excluded.

### Conclusions

Mr Miroudot drew two sets of conclusions from his study, relating to the tools of economic and statistical analysis and the implications for trade policy.

#### Analysis tools: towards a better understanding of globalization

- Measuring trade in value added is justified by the importance of trade in intermediate goods. Improved knowledge of world value chains is needed in order to understand better the nature of trade and production processes in a globalized economy.
- In this connection, it would be useful to have more detailed data on trade in services. Companies' inputs include numerous services, yet data on these services are currently relatively limited or go into little detail. Measuring trade in value added requires a better understanding of trade in services.
- World production networks have brought to light the importance of trade costs in determining supply strategies. This covers both tariff and non-tariff barriers to trade. A global approach is needed that takes into account all the costs faced by companies when importing and exporting, including transaction costs.

Furthermore, in order to improve understanding of the heterogeneity of companies in terms of their supply strategies, microdata are needed to measure trade at company level.

#### Trade policy: towards greater liberalization

- A protectionist approach makes less and less sense in the current context of vertical specialization: the most important thing is for companies to obtain supplies efficiently. The ability to import efficiently is vital in order to be export competitive. Any distortion of exports is therefore very damaging.
- In trade agreements, more importance should be given to the supplier-buyer relationship. Such agreements seek to establish fair conditions of competition between national and foreign companies. This can, however, pose specific problems that must be taken into account, e.g. "hold up" (when goods and investments are very specific to a particular company, the company that produces them cannot sell them to others and becomes dependent on its buyer) and vertical agreements that undermine competition.
- Nowadays, the notions of trade and investment must be addressed together. This is ever more frequently the case in regional trade agreements.
- Finally, to facilitate the integration of companies into world value chains, an efficient services sector (finance, transport, telecommunications, etc.) is vital, hence the need to liberalize trade in services.

Mr Miroudot's presentation raised participants' awareness of the potential of tools used to measure trade in value added, not only in terms of improving understanding of globalized Western economies but for promoting informed and context-appropriate decision-making.

#### **A number of comments were made following Mr Miroudot's presentation:**

- *With regard to the import content of exports:* Mr Artus asked about the import content of exports, levels of which are identical for France, Germany and China. He found this surprising when there seemed to be far more vertical specialization in Germany. Mr Miroudot replied that vertical trade measurement detects a company's use of a foreign input, whatever the size of the company. However, in reality, complex production networks involving dozens of countries account for a very small share of the import content of exports. Distinguishing between complex networks and more basic imports such as those effected by SMEs would make it possible to differentiate between the situations of China, Germany and France. Mr Daudin expanded this reply by emphasizing the importance of the effect of sectoral composition, which gives German exports a higher import content.
- *With regard to taking into account the depreciation of capital goods:* Mr Daudin and Mr Arthuis noted that when Europe exports a durable good to Asia, it may be used in the production of goods subsequently destined for Europe. In fact, part of the depreciation of the durable good produced in Europe is found in the cost price in Asia. In the final consumer good imported by Europe, there will therefore be an element drawn from European value added. Measuring such dimensions can be difficult.

#### **B. Two Examples: Germany and France**

Ms Dalia Marin and Ms Danielle Schweisguth presented results concerning two specific countries, Germany and France. Their presentations showed how a value-added approach to international trade can promote understanding of a country's position as regards production processes and international trade.

Ms Marin, a professor at Munich University, focused on the new international division of labour, which in Germany has led to a high level of offshoring to Central and Eastern Europe and a redistribution of skills and employment in the region.

Ms Schweisguth, an economist at the OFCE, presented the results of a study conducted with Mr Guillaume Daudin, professor of economics at the University of Lille I and OFCE research associate, and Ms Christine Riffart, senior economist at the OFCE, the purpose of which had been to re-establish the truth about France's international trade position by using tools that measured trade in value added.

#### **1. Offshoring to Central Europe and its impact on the German economy**

Ms Dalia Marin explained that four key stylized facts illustrate the new international division of labour and, ultimately, the new organization of production in international value chains:

- The growing share of intermediate goods and components in world trade;
- The growth of intra-company trade and trade in tasks, i.e. trade which takes place within multinationals between a parent company and its subsidiaries;
- The sharp increase in foreign direct investment (FDI) flows;
- the emergence of countries that engage heavily in trade ("super traders").

In this context, companies must make two decisions, firstly regarding the control that they wish to exercise over production activities (question of outsourcing) and secondly regarding the place of production (question of offshoring). In Germany's case, the offshoring of activities to Central and Eastern Europe has therefore taken two forms: it has taken place either within the company (through FDI) or via outsourcing (use of a local and independent supplier). Ms Marin's presentation focused on the causes and effects of such offshoring.

#### **Measuring the extent and advantages of offshoring to Central and Eastern Europe**

FDI serves to provide a preliminary estimate of the extent of German offshoring to Central and Eastern Europe. While only 5.4 per cent of German FDI flowed to Eastern Europe between 1992 and 1994 (dropping to 2.4 per cent between 2000 and 2002), this figure rose sharply between 2000 and 2010 (reaching 13 per cent between 2004 and 2006) when German companies began an intense phase of offshoring to the region. FDI flows alone, however, are not enough to provide a precise measurement of this phenomenon. In fact, not all of these flows involve offshoring. In order to improve this measurement, Ms Marin had gathered data on all German and Austrian FDI flows to Central and Eastern Europe between 1990 and 2001. Only by placing

oneself at the level of each company, is it possible to see whether the offshoring takes place within or outside the company. Ms Marin had then selected the cases where intra-company trade had taken place, i.e. where the parent company had exported to, and then imported from, a subsidiary located in Eastern Europe.

The results of this study show that around half of German FDI flows to Eastern Europe involve offshoring. The proportion rises as high as 70 per cent for the Czech Republic and Slovakia. In total, more than one fifth of German imports from Central and Eastern Europe are linked to intra-company trade (from a subsidiary to its parent company), with peaks of 65 per cent for imports from Slovakia and 40 per cent for imports from Hungary. Offshoring mainly involves the manufacturing sector (56 per cent), and transport in particular (30 per cent).

It is then possible to assess the labour cost savings made by German companies by offshoring to Eastern Europe. When a German company uses an independent supplier in that region, unit labour costs do not change, since wage and productivity levels in Central and Eastern Europe represent a small and identical proportion (23 per cent) of German levels. On the other hand, when a German multinational trades with its own subsidiaries, it can improve worker productivity by providing technology and applying its organizational skills. With wages in subsidiaries remaining low in relation to those in parent companies, offshoring allows for a significant reduction in unit labour costs.

### **The Marin paradox?**

Calculating the ratio between the research and development (R&D) activities (in value terms) in Eastern European subsidiaries and those of the parent company gives an average of 1.12 for Germany, which means that the production of subsidiaries in Eastern Europe is more intensive in R&D than that of the parent company. The ratio rises to 2.9 for Russian subsidiaries and 1.7 for Czech subsidiaries. What is more, offshore activities in Central and Eastern Europe are almost three times more intensive in skilled labour than the activities of parent companies in Germany. This is Germany's response to its skilled labour shortage: it has chosen to offshore to Central and Eastern Europe because of the region's cultural, geographic and often linguistic proximity.

Within international value chains, Germany therefore tends to specialize in activities requiring unskilled labour, while Russia, Ukraine and the new Member States of the European Union specialize in those that are intensive in highly skilled labour. In 2007 for example, only 24 per cent of the German workforce had a higher education qualification, which is lower than the average for the OECD countries (26 per cent), the Baltic States (30 per cent) and Russia (53 per cent). This last figure, from ILO sources, was the subject of much discussion between

Mr Daudin and Ms Marin, but no clear-cut explanation could be given for why it was so high.

The conclusion, then, is unexpected and paradoxical. Just as Leontief's paradox, in the 1950s, showed that the United States specialized in the export of goods intensive in unskilled labour, it would seem that in Germany's case, we can talk about the "Marin paradox".

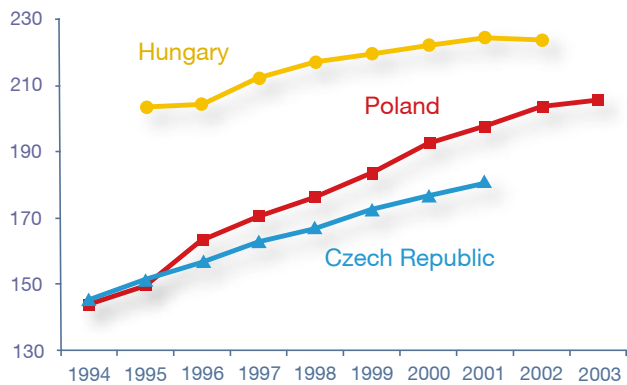
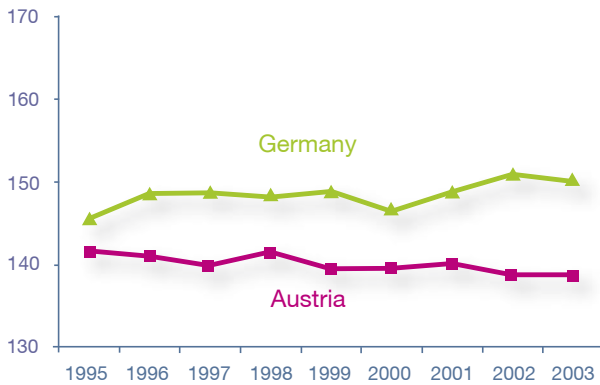
The impact of the international reorganization of German production chains

The impact of these new specializations is twofold:

- The wages of skilled workers relative to unskilled workers rose only very slightly in Germany between 1995 and 2003 (0.21 per cent a year) and yet have increased considerably in the new EU Member States, most notably Poland (4.4 per cent a year).

Without outsourcing, the relative wage level for skilled German workers would have risen by 0.3 per cent a year instead of 0.21 per cent. In Germany, offshoring and outsourcing have therefore been more detrimental to skilled workers than unskilled workers. This is the opposite situation to that in the Mexican maquiladoras (subsidiaries or subcontractors of US companies), which specialize in activities that are intensive in relatively unskilled labour.

## Wages of skilled workers relative to unskilled workers (per cent)



Source: Dalia Marin.

Significant productivity gains. Offshoring has enabled German companies to increase their productivity by 20 per cent. A company's productivity is, on average, higher when the customs tariffs applied to its imports are low and when its intra-company trade is developed.

## Conclusions

Germany's excellent competitiveness is the result of a successful reorganization of value chains. The German Government has not needed to implement a restrictive wage policy: by offshoring their activities to subsidiaries in Eastern Europe, German companies have been able to improve their productivity and lower the skill premium.

Ms Marin emphasized the human resource policy-related conclusions drawn from her study:

- If Germany wants to avoid offshoring, it must liberalize flows of skilled workers from Central and Eastern Europe, in particular those from new EU Member States. This would enable it to improve its comparative advantage in respect of skilled-labour-intensive goods. While such flows have already been liberalized in France, this will not be the case in Germany until May 2011.
- Fiscal incentives should be introduced so that foreign students who have studied in Germany may stay in the country to begin their career. Germany loses a large part of the investment put into training these students by forcing them to return to their respective countries after completing their studies.

The stagnant skill premium reduces the Government's incentive to invest in education, yet such investment remains vital.

- Ms Marin's presentation evoked a lively response from the participants: Mr Artus found it thought-provoking and joked that from now on Germany should be classed as a "bottom-of-the-range

country". Ms Marin's conclusions showed that the consideration of micro-economic information improves understanding of new international production structures and their impact.

### A number of comments were made following Ms Marin's presentation:

- *On the possible unemployment of skilled persons in Germany.* Mr Artus inquired whether offshoring to Central and Eastern Europe and the transfer of skilled jobs had happened so quickly that they had caused unemployment affecting skilled Germans. Ms Marin replied that although variations could be observed between the different sectors, there was clearly a high demand for skilled labour in Eastern Europe and a stagnation of the skill premium in Germany.
- *On the spillover effects of offshoring.* Mr Escaith compared this situation to that in Mexico, where numerous workers, after improving their skills and work capacity in maquiladoras, left to set up their own companies. Mr Escaith wondered whether the same sort of thing occurred in Eastern Europe. Ms Marin confirmed that it did, but said that the extent of the spillover depended on the purpose of the FDI, i.e. intra-company trade or access to the local market.

## 2. French foreign trade measured in value added

The work of Mr Guillaume Daudin, Ms Christine Riffart and Ms Danielle Schweisguth is based on a global trade model created using data from the Global Trade Analysis Project (GTAP) (Purdue University, United States). This model takes the form of an input-output table covering 55 sectors and 112 countries over three separate years (1997, 2001 and 2004). The presentation focused on France, although similar analyses are possible for the other countries in the model. The aim of the model is to trace the origin of the value added of goods through their direct and indirect components so that the international division of labour becomes clearly visible.

Ms Schweisguth's presentation shed new light on France's true position in world trade, on the country's strengths and weaknesses and on the true geographical and sectoral determinants of its competitiveness. The table in question is not from any official source and is not, a priori, designed for calculations made at the OFCE. However, the GTAP data used are the only available worldwide data that harmonize trade flows with input-output tables. Though imperfect, this method shows what could be achieved with a proper database devoted to measuring trade in value added.

### France's integration into international trade

Trade in value added is complementary to vertical trade: for an exported product, one must calculate all the value added it contains and subtract all the value added of imported inputs so as to avoid double counting along the production chain.

The method presented by Ms Schweisguth allows for the calculation of interesting ratios:

- *Import content of French exports.* In 2004, the import content stood at 25 per cent, having increased only slightly since 1997 (22 per cent). The international supply of inputs is therefore not a new phenomenon. France is in line with the world average (25.8 per cent), which has also increased in recent years.
- *Share of re-exported French exports.* In 2004, this share stood at 24.6 per cent, which was once again a slight increase on 1997 (23 per cent). The French level is slightly lower than the world level.
- *Share of French exports consumed in France.* In 2004, this share was 1.6 per cent, as opposed to 1.8 per cent at world level and 7 per cent for the United States. The value obtained depends to a large extent on the size of the country (ratio of proportionality to the surface area of the country).

### The geography of French trade in value added

Measuring trade in value added has other consequences for France:

The bulk of France's bilateral trade surpluses and deficits are reduced. Its surplus with the United States, however, increases. This is due to the fact that many French goods are exported to other North American countries for processing before final consumption in the United States. Measured in value added, France's trade balance with the United States is in fact improving. A shift to measuring trade in value added prevents distortion linked to the existence of world value chains.

### Illustrative example. Milk produced in France

- *Import content of French exports:* French dairy cows are sometimes fed imported cereals. Where France produces its own cereals for feed, imported fertilizer may be used.
- *Re-exported French exports:* powdered milk, produced from French milk, may be exported to produce yoghurts, which will in turn be exported elsewhere.
- *French exports consumed in France:* yoghurts produced abroad using French powdered milk may subsequently be re-imported into France.

A shift to measuring trade in value added modifies bilateral balances but does not affect the global balance.

For countries that are geographically close, the intensity of trade decreases when it is measured in value added. The shift to measuring trade in value added therefore reduces the phenomenon of regionalization. This is because vertical trade is more frequently conducted at local level, to reduce transport costs or to benefit from cultural proximity.

In short, the global trade balance deficit is not modified by the shift to measuring trade in value added, but its geographical distribution is. Trade in value added is less regional than standard trade, and we see a return towards average bilateral deficits and surpluses.

### Strengths and weaknesses of different sectors

A sectoral approach makes it possible to determine the distribution of trade in value added in different sectors of the French economy:

#### Consequences of the shift to measuring trade in value added: Germany and China

- *Germany.* As in the case of France, the vast majority of bilateral surpluses and deficits are reduced, with the exception of the surpluses with the United States and Eastern Europe (see presentation by Ms Marin).
- *China.* Bilateral balances are modified considerably: the surplus with the United States is reduced by a quarter, while the deficit with the "Dragons" is reduced by two thirds. These modifications correspond to the existence of world value chains, which, as can be seen here, considerably distort the traditional measurement of trade.

- The import content of exports varies greatly according to sector. In France (and Germany) this content is high for electronics, capital goods and automotive products, and low for services and agricultural products. It is, however, lower in all sectors of the US economy (the United States has a lower level of openness).

- The value added included in goods can then be broken down by sector and geographical origin. This makes it possible to determine the extent to which each sector's production is dependent on foreign countries and other sectors of the economy. The share of goods of foreign origin in the value added of a French transport-related capital good, for example, is much higher than for a French food sector product.

The shift to measuring trade in value added therefore modifies:

- *The level of openness of sectors.* In value added, this level is higher for agrifood products and services, and lower for manufactured goods. A product such as raw milk is very rarely exported as such, hence a level of openness lower, in principle, than 1 per cent. Milk is exported mainly in processed form (powder, cheese, yoghurts): value-added measurement therefore brings the openness level of the milk sector closer to that of other agrifood sectors (over 20 per cent).

#### In a French car...

- 65% of the value added is produced in France (30% in the motor vehicle sector and 35% in other sectors);
- 35% of the value added is produced abroad (5% in the motor vehicle sector and 30% in other foreign sectors);
- In total, 35% of the value added is produced in the motor vehicle sector.

#### In a food product produced in France...

- 84% of the value added is produced in France (45% in the food sector and 39% in other sectors);
- 16% of the value added is produced abroad, mainly in sectors other than the food sector;
- In total, 35% of the value added is produced in the food sector.

Source: Daudin, Riffart, Schweisguth.

- *The sectoral distribution of French foreign trade.* In standard trade, 76 per cent of exports are secondary manufactured goods and 20 per cent are services. In value added, the services share more than doubles. The standard measurement of exports of manufactured products takes into account the services integrated in the value added of products. Measuring in value added makes it possible to avoid this integration.

- *Sectoral comparative advantages.* Value-added measurement creates new comparative advantages for France in certain sectors (business services) and dilutes advantages in other sectors (automotive, chemicals).

### Conclusions - "There is no such thing as a non-tradable product"

The value-added measurement of trade modifies the geography of French trade in bilateral terms. The services sector figures much more prominently than in standard trade. The value-added approach refines our understanding of French trade and reflects the true share of each sector. Having a realistic picture of trade opens the way for a more detailed analysis - one can determine which jobs rely heavily on international demand or which sectors are key to French competitiveness.

Ms Schweisguth put forward a number of suggestions for developing the value-added approach further:

- *More sectors.* It would be useful to increase the number of sectors in the world trade model so as to deepen the analysis. Services, in particular, are not adequately disaggregated, even though their importance in trade has increased through the shift to value-added measurement.

- *Questionable hypotheses requiring correction.* Does the proportion in which a good is used as an input vary according to whether the good is imported or produced domestically? Is a good more often exported if it uses domestic or foreign inputs? In both cases, it has been postulated that no difference exists; it would, however, be useful to conduct supplementary studies to verify the validity of this hypothesis.



## C. Methodological Aspects of Measuring Trade in Value Added

To conclude the first part of the Conference, Mr Andreas Maurer, Chief of the International Trade Statistics Section in the WTO Economic Research and Statistics Division, provided an overview of the statistical methods currently used to measure trade in value added and presented a number of possible options for future data collection.

### Three methods for measuring the fragmentation of production

Current trade statistics hide the truth about the internationalization of production processes. While such internationalization is nothing new, it has been the focus of particular attention over the last ten years due to an increase in outsourcing and offshoring, a reduction in transport and communication costs, and improved trade logistics. Final consumption has changed due to a broadening of the range of goods and services.

#### Ms Schweisguth's presentation elicited a number of comments:

- On the weight of services: Mr Artus stressed that more data would help to improve our understanding of the importance of the services sector. Mr Arthuis remarked that the weight of services raises a real question with regard to social cohesion. Even when services were previously internalized, a small group replaces large numbers of workers who lose their role in the value added. This involves massive transfers of income which benefit very few.
- On the subject of France and Germany: according to Ms Marin, even though France and Germany appear to have similar value-added trade structures, there is one key difference between the two countries: France's workforce is relatively more skilled than Germany's. The two countries therefore have different specializations in the production chain. In Germany, offshoring has not increased unemployment, as jobs created in Eastern Europe supplement jobs in Germany. In this way, companies have managed to increase their productivity and market share. Ms Marin said that she would be interested to learn about the impact of offshoring on unemployment in France.
- On underestimating the scale of the phenomenon: Mr Daudin pointed out that because of the preliminary hypotheses under consideration, notably the fact that the nature

and source of a company's inputs give no indication as to whether it serves the domestic market or an export market, the extent of the reduction of bilateral trade balances is underestimated. More precise figures would make it possible to obtain even better results.

Since most goods produced nowadays are "Made in the World", a new statistical framework for measuring trade in value added would help us to understand fully the nature of trade relations at world level. There is currently no exhaustive, solid statistical framework for measuring the international fragmentation of production. Three existing techniques may, however, be used as a starting point:

- *Direct measurement at company level:* this technique requires the collection of micro-economic data at company level. Each link of the production chain adds value;
- *measurement through standard trade statistics:* the current framework already allows for the monitoring of trade in components and intermediate goods;
- *indirect measurement through input-output tables:* input-output tables are the only statistical instruments that can properly measure fragmentation. The use of international tables makes it possible to monitor relations between countries and between sectors. They can also be used to calculate the extent to which national sectors rely on other sectors, both national and foreign.

The simplest way of measuring vertical trade was described by Hummels in 1998: it involves calculating the relationship between the value of imported intermediate goods and the total exported gross output. However, this version of the import content of exports does not take into account intermediate goods that cross several borders. Nor does it consider the import content of inputs produced at national level.

It is, in fact, through indirect measurement based on international input-output tables that the origin and destination of the intermediate goods and services traded between the sectors of different countries can be fully described. The Leontief inverse matrix takes into account all relations between countries and sectors so as to reflect in full the value of the imported inputs used directly and indirectly by each sector.

### International trade statistics: current accounting rules

International trade statistics are subject to precise definitions, the aim being that all States apply the same statistical methods. The counting of flows is based on a simple principle, described in the UN Compilers Manual: “As a general guideline, it is recommended that international merchandise trade statistics record all goods which add to or subtract from the stock of material resources of a country by entering (imports) or leaving (exports) its economic territory.”

According to the general trade statistics system, the statistical territory of a country (i.e. the territory to which the records of inflows and outflows apply) must coincide with its economic territory. The goods and services to be included in and excluded from trade statistics are very clearly listed in the statistical rules set forth in the UN International Merchandise Trade Statistics Compilers Manual (2004).

In a context of growing production fragmentation, we are particularly interested in rules concerning flows of the following goods:

- Goods for processing: these are goods sent abroad or brought into a country for processing, including processing under contract. Such goods are therefore part of a global production chain. The rule says they must be included;
- goods traded between a company and its subsidiaries abroad: these goods must also be included;
- returned goods: these goods are first imported then subsequently returned unchanged. At the time they are returned, these goods must be included as exports;
- goods temporarily admitted or dispatched: these goods are to be distinguished from those above insofar as it is known that they will be returned within a limited time, e.g. containers connected with transport; animals for breeding or racing; and commercial samples. These goods are to be excluded from trade statistics;
- goods in transit: unlike the two previous categories, these are goods that enter and leave a country with the exclusive purpose of reaching a third country. They are to be excluded from trade statistics.

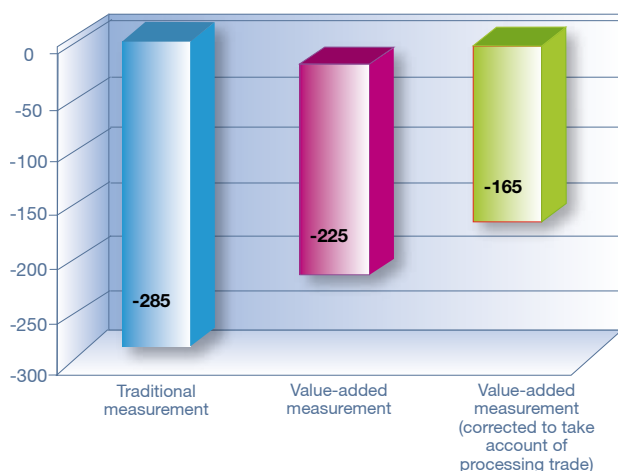
### Limitations of measurement methods

Even though input-output tables provide the most advanced conceptual framework for measuring the fragmentation of production, they require high-quality data and are, at present, drawn up only for target years (every five years at most). It has not yet been possible to carry out this exercise on a regular basis.

There is also a hypothesis that the intensity of use of imported inputs does not vary, regardless of whether the end products are consumed locally or exported (hypothesis of homogeneity of production). In reality however, this hypothesis is often contradicted, notably due to the existence of a highly import-intensive processing trade. This type of trade (processing of imported inputs and re-exports) accounts for a significant share of international trade. One fifth of developing country exports come from processing zones. While the shift to value-added measurement already significantly corrects the US deficit with China (see chart), taking into account China's processing trade reduces it even further. In total, this deficit falls by more than a third and would be even lower if only trade in manufactured goods were taken into account.



## Comparative table of the US trade deficit with China, by calculation method (2008, in billions of dollars)



Source: Andreas Maurer.

All measurements effected hitherto have been limited by incomplete world value chains. To understand the value chain in its entirety, we need a comprehensive conceptual framework for measuring world value added.

### Towards an exhaustive conceptual framework?

In 2010, Koopman, Powers, Wang and Wei devised a conceptual framework for measuring trade in value added, which has the advantage of establishing a formal link between traditional trade statistics and value added. This model makes it possible to detail fully the sources of inputs. Gross exports are subdivided into:

- Domestic value-added exports that can subsequently be
  - consumed directly by the importer,
  - or reused and exported to a third country;
- reimported domestic value added;
- exported foreign value added (integrated in domestic exports).

The results obtained by these authors provide an insight into the composition of value-added exports for each country. For example:

- Almost half of all Chinese value-added exports are consumed directly by importers in the form of final consumer goods, while this proportion is only a quarter for Malaysia. This would suggest that China is situated much further down the world value chain than Malaysia.

- The share of domestic value added in exports is lower in industrialized South-East Asian countries than in developed countries.

These interesting results illustrate the potential of such an approach for guiding the decisions of trade policy makers.

### Outlook for data collection

Measuring trade in value added poses no major methodological problem, as the theoretical tools required are, in general, well known. The main challenge concerns data collection, which is, at present, non-exhaustive and geographically and sectorally limited. Efforts to make the collection of data more efficient are currently focused on the following three areas:

- *Collection of strategic business data:* an awareness of the determinants of corporate decisions on offshoring and outsourcing, R&D and distribution is vital for explaining world value chains. A European survey of business activities is currently under way and should provide information on how strategic management and development varies according to the level of outsourcing and offshoring.
- *Trade by Enterprise Characteristics (TEC) database:* this database, developed by the OECD, makes it possible to link business registers with trade registers. These data could be used to calculate the import content of exports for individual companies.
- *International input-output tables:* compiled from official statistics by an international research consortium, these tables currently cover 40 countries, 59 products and 35 industries. Inter-regional tables could be drawn up to show trade balances between the main world regions.

### Conclusion

The first part of the Conference highlighted the usefulness of measuring trade in value added in a context where production is fragmented internationally. The results presented were sometimes felt to be provocative, insofar as they questioned seemingly well-established truths. According to Mr Arthuis, “value-added statistics provide clarity that would be very useful for strategy definition and policy implementation”.

The speakers showed that interesting conclusions can be drawn from existing research results and statistical data: a value-added approach often reduces bilateral trade surpluses and deficits, most notably with China, which clearly illustrates how important world production

chains have become in recent years. However, a lack of data and the absence of a truly unified framework for measuring trade in value added prevent statisticians and economists from going any further. During the course of the presentations, reference was made to steps that could be taken in the years to come:

- *In terms of data.* The work carried out so far has often been based on data collected in a makeshift manner or from sources not a priori suitable for research purposes. The speakers called for greater efforts in two areas: data concerning services sectors, which are often imprecise or not sufficiently disaggregated, and the collection of microeconomic data drawn from company accounts. In this connection, Mr Arthuis emphasized the importance of reconciling the microeconomic accounting of companies with macroeconomic elements of national accounting. Efforts must be made to ensure full harmony between these two levels.
- *In conceptual terms.* Existing techniques for measuring trade in value added are already well known and benefit from being used in conjunction. There are now, however, two conceptual challenges: to relax the hypothesis of homogeneity, which can only be envisaged through more exhaustive data collection; and to record the depreciation of capital in trade, so as to take into account, for example, the share of French value added that comes from French machine tools exported abroad to produce goods imported by France.

- *In political terms.* Measuring trade in value added makes it possible to have a clearer view of the economic role of each country and each sector in international trade. It enables political decision-makers to make measured and informed decisions. In particular, it confirms the growing interdependence of countries and sectors in a globalized economy, a situation which not only makes any call for protectionism useless and dangerous - not to mention costly, including for those issuing the call - but demands greater global economic stability, particularly in terms of exchange rates.

### III. Measurement of trade in value added and statistical and economic implications of globalization

#### Introduction

The first part of the Conference, thanks to the work of a panel of economists and researchers, highlighted the benefit of a value-added approach for understanding international trade. The second part, “Statistical and economic implications of globalization”, aimed first and foremost to show that such an approach also serves to improve policy responses to a wide range of economic issues - development, employment, environmental protection. The afternoon session was thus an occasion to broaden possibilities and discuss applications - many of them original - for the measurement of trade in value added. It also enabled speakers to take stock of the expectations and needs of the various players in the French economy - from enterprises to the State, and of course economists and statisticians - in terms of measurement of trade in value added.

Mr Jean Pisani-Ferry, Director of Breugel and member of the Council of Economic Analysis, took over from Mr Artus as moderator. He introduced the subject briefly, pointing out that the session was a good opportunity for forging a link between measurement problems and economic policy implications.

The afternoon was divided into four stages:

- First, **Mr Hubert Escaith**, Chief Statistician of the WTO, pointed out, citing Asia as an example, the many contributions a new statistical vision of trade can make to understanding the workings of production chains in emerging economies and developing countries.
- Next, **Ms Lilas Demmou**, Research Associate Erasme-EPI Université Paris VIII, addressed the issue of deindustrialization in France, describing the determinants of industrial job losses.
- She was followed by **Mr Jean-Phillippe Cotis**, Director-General of INSEE, who presented an original application for the value-added approach, applying the concept to carbon dioxide emissions.
- Lastly, a round table moderated by **Mr Jean Pisani-Ferry** concluded the proceedings with an assessment of the issues and institutional challenges involved in measuring France’s foreign trade in the context of globalization.

#### A. The Transformation of Production in Developing Countries and Emerging Economies: The Asian Example

Mr Hubert Escaith, Chief Statistician of the WTO, Economic Research and Statistics Division, sought

in his presentation to link up statistical tools with the recent phenomenon of changes in production chains in developing countries and emerging economies. The Asian example is a typical case study for which the measurement of trade in value added sheds particularly useful light as regards:

- Changes in trade in recent years;
- the implications for economic development, employment and private investment;
- the role of public policy on trade facilitation;
- possible scenarios.

“Thought being the richer when the fruit of a common endeavour”, the WTO worked on the Asian case in collaboration with the Institute of Developing Economies, Japan External Trade Organization (IDE-JETRO).

#### Evidence of Asia’s emergence

Asia’s emergence has not until recently been at the expense of the other major industrial development poles (North America, Europe), but has long been parallel to the continuing development of those other poles. This is shown by the entry flows of foreign direct investment (FDI), which until 2005 increased in unison in all the regions of the world. The North-North component of FDI considerably exceeds the so far limited North-South component. However, the global distribution of FDI flows has become less clear as the emerging countries have grown in importance. In fact, the destination of FDI in the emerging countries is not very well known; in China, for example, 60 per cent of FDI flows are counted as “unclassified”.

The trade in inputs has followed the same growth pattern as FDI: Asia is now the second largest importer of intermediate goods after Europe, and is the continent where the growth of such imports is the highest.

However, the emerging Asian countries are not identical in terms of exports of intermediate goods. The export profile is a reflection of both the natural resources available and the form of integration into global value chains. For example, as regards the export of primary inputs, Indonesia and India are major players, whereas Japan and Chinese Taipei are much more involved in the export of inputs that have already been processed. Thus, the export profiles of inputs reveal each country’s degree of competitiveness.

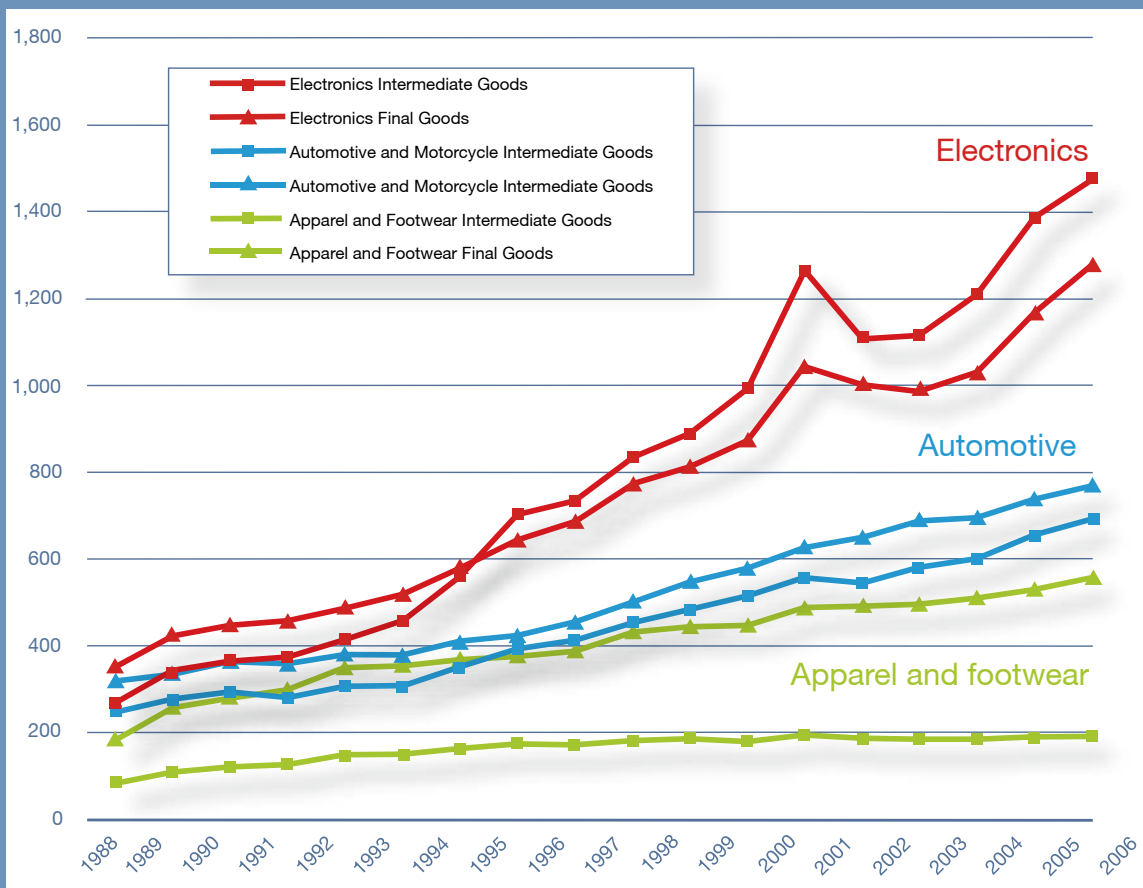
#### Specialization in Asia

Asia is strongly represented in three major global production chains: apparel and footwear, the automotive industry and electronics. An examination of world trade

in inputs and finished goods in these sectors shows that while the trade flows for electronics and the automotive industry have grown in parallel, the gap has gradually widened in the case of the apparel and footwear sector, which seems to indicate that relocation has stabilized in that sector. This corresponds to the end of the Multi-Fibre Arrangement, which set quotas and led to an artificial dispersion of production. The growth of low-cost production in Asia (China, Bangladesh, Cambodia, Viet Nam, Pakistan) was accompanied by a relocation of high value-added products to Europe, especially in the case of women's goods that are sensitive to changes in fashions (locating in Asia means losing the ability to react quickly in this field, given the importance of the distance factor). Although the major production chains now have a

global dimension, they are still largely regionalized, being mainly centred on the major world industrial development poles. The global chains therefore exist in parallel with overlapping regional chains. In the case of the automotive industry, one of the production chains in which Asia is traditionally strong, it is in Asia that the trade in spare parts is most intense, as is very clearly shown by the example of the production chain of the Toyota group. This is also the case in the electronics industry, in which three major regional centres share most of the production chain: North America, Europe and Asia. The more complementary the differences between regional partners, the more the regional chains are strengthened through specialization and the trade in tasks. However, there is nothing final in the gains achieved by

**Trends in the World Trade of Intermediate and Final Goods in the Electronics, Automotive and Apparel and Footwear Sectors (Billions of Dollars)**



Source: Based on data from Sturgeon/Memedovic, 2010.

N.B.: Mr Arthuis raised questions concerning the electronics sector, in which the trade in intermediate goods is, in terms of value, higher than that for final goods (since the mid-1990s). Several explanations were put forward:

- Mr Miroudot pointed to the changes in classification in the mid-1990s, which could have had an impact on the comparability of the statistics.
- Mr Pisani-Ferry stated that while the apparel and footwear sector has returned to a very traditional model of trade in goods, the electronics sector is seeing the development of trade in tasks, which means that growth is mainly based on the trade in intermediate goods.

international production chains, and in this connection the example of computer production in Chinese Taipei is particularly pertinent. After rising strongly in the 1990s, production in this field reached its highest point in 2001-2002, before falling back very rapidly to a level close to 15 times less in the space of only five years. In fact, after the accession of China to the WTO in 2001, followed shortly afterwards by the accession of Chinese Taipei, manufacturers in Chinese Taipei massively relocated the final phase of computer production to China. Only a few component producers remained in Chinese Taipei. This example illustrates the high degree of volatility and fluidity in international relations between industries.

### The distribution of value added in Asia

A breakdown of the different contributions of labour and capital in adding value provides more information on the factors determining the competitiveness of each of the countries involved in world trade. In the international production chains in the automotive and electronics industries we have seen a steady rise on the part of China, based on increases in both the contribution of unskilled labour and in domestic and foreign capital investment in the value added exported. Even if the data on the share of capital and labour in Chinese value added remain limited, it is still possible to state that China exports both unskilled labour and capital in the automotive and electronics sectors. However, it is not the amount of domestic capital, but rather the very high contribution of unskilled labour to exports, that differentiates China from other non-Asian countries or even the United States. The share of value added exported by Japan attributable to domestic capital amounts, in the automotive sector, to 40 per cent, which is higher than the Chinese case. However, while the contribution of unskilled labour in China is 35 per cent in this sector, Japan and the United States, on the other hand, mainly rely on a workforce with medium and high skill levels.

### And the European case?

The European model is different from the Chinese, Japanese or United States models. In Europe the imported content in capital and in medium and highly skilled labour has a higher share in the value added exported. Inter-industrial exchanges are more homogeneous in Europe, which would seem to indicate that intra-enterprise integration is more advanced. There is less wage differentiation between European countries.

### Regions still excluded from the internationalization of production chains

The recent growth in industrial integration encourages economic interconnection. Thus, any economic policy has a worldwide impact, as shown by two examples analysed by IDE-JETRO:

- The direct effects of the economic crisis in the United States, measured solely in terms of inter-industrial relations (excluding macroeconomic and financial effects), entail a loss of 750,000 jobs in China. This fall in activity in China should in turn have indirect effects on industrial employment in other Asian countries located further upstream in the production chains, since these countries deliver semi-finished goods to China. A decrease of activity in China is reflected in a decrease in orders to Japan and other countries. The figure obtained is a projection of the impact on the basis of the input-output tables for 2005. In fact, the total impact has been greater, but the methods used by IDE-JETRO make it possible to map out the possible effects, without attempting to make a forecast.

- IDE-JETRO has calculated that the Chinese anti-cyclical budgetary policies (a stimulus package of 520 billion dollars) have partly offset the impact of the crisis for the partner countries, in particular, for United States and Japanese firms which provide China with capital goods for its domestic economy. However the other countries of the ASEAN group, which send semi-finished goods to China for assembly for the United States market, have not benefited from this Chinese stimulus plan.

The strong rise of the emerging countries between 1995 and 2009 was accompanied by a rebalancing of East-West relations (rather than North-South relations): the share of the middle-income countries as importers of intermediate goods greatly increased during this period, from 14 per cent to 29 per cent. However, the third group of low-income, non-emerging countries located far away from the centres of production are still largely excluded from the global production chains. Integration would be beneficial to them, as it has been for China which has, through integration, been able to raise millions of people out of poverty.

Africa is the part of the world most affected by this lack of integration into the production chains. Despite the economic crisis, the regional centres have remained the same (North America, Europe and Asia). It is true that Latin American countries exporting primary goods and having an already established industrial base have benefited from the crisis. However, in Africa, the future remains very uncertain, especially as regards the capacity of countries to integrate themselves into regional chains (they are too similar to benefit from complementarities).

For these countries to integrate effectively into the global production chains, old-style tariff policies are no longer relevant. It is more useful to reduce transaction costs and increase a country's competitiveness through improvements in logistics and better administrative procedures. The World Bank has recently measured the average time required for the export of a container and the money cost involved in such an export. In the sample studied, the East-Asia and Pacific region shows the best cost, even though the time required is not very competitive. On the other hand, sub-Saharan Africa is far removed from these production chains and faces higher transaction costs. In view of this handicap, development aid should be re-examined so as to focus on the facilitation of trade and infrastructures, in order to stimulate productivity.

### Conclusions: for a new statistical approach

In order to reach a better understanding of the changing trends in world trade and their political implications for development, employment and investment, it is necessary to adopt a new statistical approach which encompasses:

- The macroeconomic dimension of the input-output tables (measurement of trade in value added, and the distribution of this value added between labour and capital) and of the balance of payments (FDI, investment processes, repatriation of profits);
- classification by major economic categories, which provides more information by disaggregating the traditional trade data;
- microeconomic data - case studies, company accounts - which help to give a better understanding of the industrial logic of these phenomena.

In Mr Escaith's view, one possible line of approach would be to bring together the specific data in a satellite account as part of the national accounts, which would make it possible to unite microeconomic and macroeconomic data within a single framework.

### The presentation by Mr Escaith gave rise to a number of questions and comments:

- *Concerning the need for national accounts data:* Mr Michel Sérurier, former Professor of National Accounts at ENSAE, requested the participants to inform him of their needs regarding the quality of statistical data and national accounts since, in his opinion, the newly established System of National Accounts (SCN2008) omits much of the information needed. Mr Escaith added that the last reform of the SCN placed greater emphasis on the financial aspects at the expense of production, a choice which resulted, in his view, from disputes between national accounts experts often defending their own approach, and from the excessively high cost of seeking to discover the true situation of companies when there was a lack of administrative data (in the case of intra-European trade). As a consequence, some information previously available through statistical data was now only accessible through specific enquiries since the subcontracting companies no longer kept the statistical records necessary for monitoring production. In particular, when a transaction does not involve a change of ownership, it is no longer recorded in the national accounts. However, many intra-company transactions between subsidiaries may or may not give rise to a change of ownership for purely fiscal reasons. In Mr Escaith's view, it is therefore dangerous to make such fundamental statistics subject to taxation agreements that may change from one day to the next. A possible approach would be to adopt this form of net accounting, on condition that the basic production data are retained so that at a given time they can be converted to make them compatible with the new balance-of-payments recommendations.
- *Concerning the timescales for statistical processing:* Mr Arthuis, after having pointed out that up-to-date statistics were necessary in order to enable decision-makers to halt or redirect their strategies, observed that the statistics submitted often stopped in 2006 or 2008 and he wished to know how statisticians could ensure the immediate relevance of their work. Mr Escaith replied that the timescales for the preparation of global statistics were mainly dictated by the difficulty of obtaining and processing data from developing countries. In his opinion, in the current state of affairs, data for the 70 major world economies could be available within a year or so, but for the least developed countries the time horizons were inevitably longer.



## B. The Structure of Employment in Post-Industrial Societies

Ms Lilas Demmou, Research Associate, Erasmus-EPI, Université Paris VIII (formerly at the Directorate-General of the Treasury), began her statement by pointing to the loss of industrial jobs in France since 1980:

- *The fall in industrial employment:* between 1980 and 2007 France lost 1.9 million jobs in industry, i.e. 36 per cent of those employed in this field.
- *The destruction of jobs in industry has been accompanied by the creation of jobs in services:* the proportion of the working population employed in industry has also decreased, from 22 per cent to 12 per cent. At the same time, the proportion in tradable services has risen from 32 to 44 per cent.
- *The contribution of the different sectors to value added has also changed:* the contribution of industry to GDP has fallen by 10 points (in value) from 24 per cent to 14 per cent, while at the same time there has been a rise in the contribution of tradable services (from 45 to 56 per cent), which seems to indicate a shift towards tertiary activity.
- *In industry, employment trends are not uniform: the situation varies from sector to sector.* The consumer goods sector is the most affected (52 per cent fewer workers during the period), followed by the automotive and intermediate goods sectors (40 per cent fewer) and energy (30 per cent fewer). However, when the losses in each sector are related to total job losses, the classification is a little different. The intermediate goods sector is the largest contributor to job losses during the period, followed by consumer goods.

Given this decline in industrial activity, which is to be found in most of the industrialized countries (thus, the weight of industry in employment decreased over the period from 30 to 19 per cent in Germany, from 23 per cent to 17 per cent in Japan and from 19 to 10 per cent in the United States), Ms Demmou analysed, in the course of her presentation, the factors determining this situation and their respective scale. Three determining factors were highlighted:

- *Changes in industry boundaries,* or the outsourcing of industrial activities towards the services sector. Companies seeking gains in productivity and greater efficiency in their production process strengthen the division of labour. Some activities are transferred either to other companies in the sector or to companies in other sectors, particularly in services.
- *Structural changes of a growing economy:* this reflects changes in patterns of demand. As preferences change, fewer industrial goods are consumed and there is greater focus on satisfying new services needs.

- *Foreign competition:* imports compete with domestic production and result in industrial job losses.

### Changes in industry boundaries

The use of outsourcing means that some of the 1.9 million jobs that have disappeared have not in fact been destroyed, but only transferred. To reach an estimate of the number of jobs destroyed, the jobs transferred have to be subtracted from the total. There are indirect forms of outsourcing:

- The weight of intermediate inputs in industry has increased (75 per cent as against 71 per cent previously).
- Employment in services has also increased, particularly in tradable services (+53 per cent overall, +115 per cent for services to companies). Temporary employment has more than tripled.

However, these indirect measures exaggerate the phenomenon of deindustrialization, since they do not distinguish between demand by industry, a strengthening of the division of labour within industry or an increase in employment in services directly related to the services themselves.

The challenge is therefore to isolate that part of employment in the services sector that is directly attributable to demand by industry. In order to do this, Ms Demmou turned to a methodology described by Daudin and Levasseur, which focuses on the job content of production in the services sector (number of jobs per billion euros of goods produced) as related to the amount of services output consumed by industry (which corresponds to the intermediate consumption of services by industry).

This method is applied to all sectors of industry and reveals an increase in outsourcing. Adding outsourced jobs in each sector, we find that 480,000 jobs have apparently been transferred from industry to tradable services, of which 380,000 have gone to the business services sector. This represents between 20 and 25 per cent of the job losses over the period.

To sum up, of the 1.9 million jobs lost, 480,000 can be explained by simple transfer, while 1.4 million remain to be explained.

### Distortion of the structure of demand

The explanation for part of the destruction of jobs in industry lies in the relationship between productivity gains and changes in demand. The effect of productivity gains on employment depends on the reaction of demand. If the quantity of demand remains unchanged, productivity

gains destroy jobs, but, by lowering prices and raising income, they also stimulate demand. For employment in industry to remain constant:

- The overall gains in productivity in the economy must be accompanied by an equivalent growth in demand in all sectors (income elasticity equal to one);
- the stronger growth of productivity in industry must be accompanied by a higher rise in demand in this sector (elasticity of substitution equal to one).

The econometric and statistical data available show that these two conditions have not been met. During the period in question, in the industrial sector, demand increased less than productivity or the income of those operating in the sector. That is reflected in the fact that the weight of industry in demand has fallen, while that of services has increased. This mechanism is similar to Engel's law which explains changes in consumption behaviour as between agricultural goods and industrial goods. This time, the shift in consumption is from industrial goods to services. The fact that these conditions have not been fulfilled explains therefore the partial destruction of jobs.

*Engel's law is an empirical law formulated in 1857 by the economist Ernst Engel. On the basis of measurements of consumption and income of a group of Belgian households, Engel found that the share of expenditure on food in the total expenditure of the households fell when their income increased, whereas in the case of expenditure on "luxury" goods, the reverse was true. It is therefore possible to trace Engel curves, showing the relationship between a good and household income.*

In order to measure the effects on employment of the relative fall in demand, Ms Demmou examined a counter-factual scenario: what would have been the situation of employment in industry in 2007 if the weight of industry in demand had stayed constant since 1980? In such circumstances increased income between 1980 and 2007 would have been uniformly distributed among all sectors and the fall of relative prices in industry, made possible by productivity gains, would have been offset by an equivalent rise in demand. There are also indirect effects to be noted, that is to say, production relating to intermediate consumption. At the aggregate level, the results show that 560,000 jobs were apparently lost as a result of this demand effect, i.e. 30 per cent of the total job losses. At the disaggregate level it seems that some sectors, such as consumption goods or the agrifood industry, suffered more than others from these effects, while the automotive industry helped to create jobs and benefited from stronger demand.

### Foreign competition

It is difficult to estimate the effects of foreign competition, since the mechanisms at work are complex and not always

easy to discern. When exports increase, production increases, but that symmetry is not complete in the case of imports, since they do not necessarily destroy jobs directly if they complement domestic production. Everything depends on the degree of substitutability of production. The results relating to this third determinant should therefore be treated with caution.

Between 1980 and 2007 France's trade balance fell sharply, from -15 billion to -54 billion euros. Excluding energy, it fell from +6 billion to -9 billion euros. Finally, if trade is analysed in terms of regions of origin and their levels of development, the explanation for the deterioration in the trade balance lies with the countries of the South (-1.7 per cent of GDP over the period) rather than the countries of the North (-0.65 per cent of GDP).

In view of the difficulties in estimating the link between employment and trade, Ms Demmou used two different methods:

- *Accounting method relating to the job content of trade.* This consists in calculating in 1980 and in 2007 the jobs necessary for the production of exports, minus the jobs which would have been created if France had produced the goods it imported. The difference indicates job losses caused by trade.

- Using this method, Ms Demmou finds that trade accounts for a loss of 240,000 jobs, i.e. 13 per cent of the losses over the period. The results per branch of industry show that the branches most affected by foreign trade were apparently the automotive industry and capital goods, while the agrifood industry made a positive contribution.

- This method does, however, have certain limitations. Firstly, it is rather rough and ready, since it does not take account of a number of effects. It is based, in particular, on the hypothesis that all imports result in a loss of domestic production, while in fact the work of L. Fontagné shows that a large part of trade complements domestic production. Furthermore, job content is not differentiated according to country of origin. The job content of imports from the South is thus underestimated.

- *Econometric method.* The use of this more reliable method makes it possible to estimate over a long period the relationship between employment in manufacturing industry and trade, differentiated according to its origin in the North or South. Calculations using this method lead to the conclusion that about 740,000 jobs were apparently lost through trade with the South, i.e. about 40 per cent of the job losses recorded. That result is therefore higher than that obtained by the first method, but the estimate is of limited accuracy. This figure of 40 per cent is an average figure lying midway between a probable maximum effect (70 per cent) and a minimum effect (9 per cent).

## Conclusions

The results obtained provide a better understanding of the sources of industrial job losses in France since the 1980s. It would appear that:

- Between 20 and 25 per cent of job losses were only apparent and related to cases of outsourcing;
- 30 per cent of the losses were linked to structural conditions; this is characteristic of growing economies, in which the weight of the different sectors changes over time;
- finally, international trade, which is the determinant most difficult to estimate, caused 40 per cent of the industrial job losses during the period.

Thus, the demand effect would appear to have contributed to job creation in some sectors, in particular in the automotive industry, while foreign competition helped to destroy jobs.

The study has highlighted the benefit of a value-added approach, here associated with other statistical or econometric methods, as the best way of identifying the determining factors in the operation of post-industrial economies.

### Ms Demmou's presentation gave rise to questions and comments:

- *Concerning the logic of the approach adopted:* Ms Demmou stated that her study was not based on a general equilibrium model. The effects of productivity and foreign trade on industrial employment are not therefore totally separable (comment by Mr Pisani-Ferry) and the effects of international trade on the capital used in production are not taken into account in the contra factual scenario (comment by Mr Daudin). However, Ms Demmou stressed that the main aim of her study was to draw on statistical elements that are immediately apparent and easy to understand and which a macroeconomic approach would not necessarily allow.
- *Concerning the significance of relocations or offshoring:* Mr Arthuis referred to the results of the study by giving the example of a lorry driver previously employed by a dairy, but later employed by a transport company. That illustrates the first determinant of the loss of industrial jobs. Mr Arthuis then asked if the possible relocation or offshoring that might follow or accompany outsourcing had been taken into account in the study. Ms Demmou replied that relocation or offshoring was part of the measured impact of foreign trade, if it was defined as the elimination of a production unit in France and an increase in

imports from abroad. However, the phenomenon could not be clearly defined.

- *Concerning the work of statisticians and economists:* Mr Escaith remarked that the work of official statisticians was limited to revealing facts through the use of methodologies which are not based on highly complex economic hypotheses, in order to preserve the transparency of statistical work. Studying the causality of the new issues brought to light came more within the purview of economists. Mr Pisani-Ferry considered, however, that the boundary between the two professions was blurred. Mr Cotis stated that, ideally, there should be a continuum between economics and statistics.

- *Concerning the steering of the economy:* Mr Arthuis concluded that "the real question is whether it is possible to steer the economy. Or whether it just has a life of its own."

## C. An Original Application of the Concept of Trade in Value Added: Monitoring of the Environmental Impact

Mr Jean-Philippe Cotis, Director-General of INSEE, proposed in his statement an original application of the concept of trade in value added; arising from the report of the Sen-Stiglitz-Fitoussi Commission on the Measurement of Economic Performance and Social Progress. The central idea is to devise a system of "foreign trade in CO<sub>2</sub>".

### From the commercial impact to the environmental impact

The concept of trade in value added is important in our globalized economies since it leads us back to the source of wealth production. An automobile produced in France and exported to Germany contains many components produced abroad. It is therefore useful to separate the respective contributions of the French factory and of the foreign factories to that export. The concept of value added is indispensable for making such a separation.

Taking final demand, either foreign or domestic, as the starting point, an estimate is made of the share of the production undertaken on the national territory and the share that depends on imports. In fact, this division can be made on the basis of symmetrical input-output tables. If it is to be exhaustive, both the French tables and the partners' tables are necessary. This requirement of exhaustiveness can easily be explained: part of the French demand involves imports from Germany, which may themselves involve production in other countries, including France.

This does not pose particular conceptual difficulties - the methods are known and tested - but practical difficulties remain: a great deal of data must be collected in order to give a detailed picture of the structure of production in France and among our partners. International organizations, in particular the OECD, have a special role to play in compiling the data.

The question arises as to whether the work of data collection should be restricted to the value-added content of final demand. Other aspects of final demand could be explored in the spirit of the Stiglitz report, in particular its effects on the environment. This would involve measuring the carbon footprint resulting from CO<sub>2</sub> emissions or greenhouse gases more generally. In view of the fact that they currently exceed the planet's capacity for absorption, CO<sub>2</sub> emissions will affect the well-being of future generations.

With regard to CO<sub>2</sub> emissions, globalization is doubly involved. On the one hand, greenhouse gas emissions do not remain within national frontiers. Emissions spread over the whole planet; this is what Hardin has referred to as the "tragedy of the commons". On the other hand, the interpenetration of economies implicitly entails an international trade in greenhouse gas emissions. It becomes possible to purchase emission-rich products without having produced them oneself.

Very clear analogies can therefore be drawn between the trade impact and the environmental impact:

- Foreign trade in value added throws up a distinction as regards cars purchased in France, between those which are produced in France and those which are imported. Then, as regards the cars produced in France, it is possible to separate out the content actually produced on French territory and the one imported.
- Similarly, it may also be necessary to draw a distinction, in respect of consumption-related CO<sub>2</sub> emissions, between what was emitted on French territory and what was emitted in the production process abroad. In the case of CO<sub>2</sub> emissions, this fruitful approach makes it possible to measure the carbon footprint linked to each factor of demand (consumption, investment, exports). Emissions within the national territory linked to our exports can then possibly be reassigned to the foreign consumer.

This analysis was carried out by INSEE and the General Commission for Sustainable Development and contains many useful lessons.

### France and foreign trade in CO<sub>2</sub>

CO<sub>2</sub> emissions on French territory come from households (heating, travel) and production activities (furnaces,

refineries, fossil fuels). Total emissions amounted in 2005 to a little more than 400 million tonnes, i.e. 6.7 tonnes per capita. This ratio is five times higher than in India: the difference in this case is principally due to the fact that the levels of development are not the same (i.e. GDP/PPP per capita is eight times higher in France than in India). Compared to those of countries with the same level of development, French CO<sub>2</sub> emissions per capita are relatively low: they are 1.5 times lower than in Germany and 3.5 times lower than in the United States. This is due to the predominant role of nuclear and hydroelectric power in the production of electricity and to a petroleum taxation system which encourages energy savings.

Starting from this general framework, it is possible to calculate the level of CO<sub>2</sub> emissions resulting from the trade in goods. Just as it is possible to monitor value added along the production chains, it is useful to determine the content of CO<sub>2</sub> emissions at the various stages of production. Several indicators provide information on France's competitiveness in this area:

- *CO<sub>2</sub> emissions caused by exports and imports:* emissions caused by French exports amounted to 95 million tonnes in 2005. Emissions attributable to foreign sources as a result of imports were 110 million tonnes. On the basis of the explanations set out above it was estimated that the value-added content of our exports was about 70 per cent (30 per cent of the value of our exports coming from foreign producers). As regards CO<sub>2</sub>, it would seem to be the other way round: more than 50 per cent of emissions resulting from our exports were apparently attributable to foreign sources. The components contained in our exports come from countries likely to be less efficient than France in the use of the energy of the countries which emit more CO<sub>2</sub> in production.
- *CO<sub>2</sub> emissions resulting from the consumption by households of goods produced in France:* these emissions amount to 400 million tonnes, of which 250 million tonnes are produced on the national territory, as a result of consumption, and 150 million tonnes abroad. The part emitted on the national territory is higher than that emitted abroad, since the emissions linked to individual heating and travel are produced exclusively on French territory.
- *Balance of CO<sub>2</sub> in foreign trade:* an examination of the carbon footprint of French exports (250 million tonnes) and the CO<sub>2</sub> content of French imports (340 million tonnes) shows that France exports part of its CO<sub>2</sub> emissions and imports, in general terms, goods with a higher emission rate in order to satisfy its domestic demand.

## Conclusions

Mr Cotis concluded by calling attention to INSEE's involvement in the "Beyond GDP" initiative, the objective of which is to look beyond mere GDP in order to assess the state of the economy. INSEE recently carried out a complete breakdown of income by quintile, involving an evaluation of public transfers (education and health valued at their market rates), which showed that public expenditure was more redistributive than taxation in France. The income of the average wage earner is hardly any higher than the income of the quartile immediately below.

In the environmental field, the study published in the 2010 edition of INSEE's *L'économie française - Comptes et dossiers* gives a breakdown of CO2 emissions by major categories of households, combining two different approaches recommended in the Sen-Stiglitz-Fitoussi report:

- An attempt to define more accurately the sustainability of our economies, in particular as regards the environment;
- the need to go beyond the macroeconomic approach in order to take account of the diversity of individual situations. This highlights the different propensities to emit CO2 depending on socio-professional category or age group. The most comfortably-off households emit 2.5 times more than the more modest households, but in terms of each euro spent, they use less energy.

This breakdown only covers the year 2005 and would need to be regularly updated in order to measure more accurately the progress achieved by France regarding CO2 emissions. The study also needs to be extended to cover other greenhouse gases. It is Mr Cotis's view that even though these projects are weighty and ambitious, French public statistics can blaze a trail in this field.

### D. Concluding Round Table: Challenges and Issues Relating to the Measurement of France's Foreign Trade in the Context of Globalization

The Conference concluded with a round table moderated by Mr Pisani-Ferry, with a panel of four participants, all involved in dealing with the day-to-day challenges and issues relating to the measurement of foreign trade:

- Mr Dominique Guellec, Principal Economist at the OECD, Head of the Service of Scientific and Technical Indicators;
- Ms Claire Lefebvre of the Department of Statistics and Economic Studies of the Directorate-General of Customs and Excise (DGDDI);

- Mr Benoît Coeuré, Deputy Director of the Directorate-General of the Treasury;

- Mr Patrick Messerlin, Professor of Economics at Sciences Po and Director of the Global Economics Group at Sciences Po.

### Comments and questions following Mr Cotis's presentation:

- *With regard to the data used:* Mr Arthuys expressed admiration for the work done, but requested further details on the data used. In Mr Cotis's view these subjects are useful and significant. The French statistical services therefore take them very seriously. They also serve as a point of application for the Stiglitz report that seeks to take account of sustainability. Carbon accounts are available for the work being done, and are indispensable in the current state of affairs for exploring these little-known areas.

- *With regard to the comparability of the carbon-accounting systems of different countries:* Ms Schweisguth pointed out that carbon-accounting systems often differ from country to country, which makes comparisons difficult. Mr Cotis replied that the accounting systems were regarded as sufficiently harmonized to enable analyses to be carried out. Mr Escaith said that a major project - the World Input Output Database - supported financially by the European Community should result by the end of 2012 in the publication of harmonized input-output matrices for the industrialized and emerging countries, together with factor analyses and an environmental accounting system. Harmonized data, including environmental data, for a number of countries, were therefore within sight.

- *With regard to emission trends:* Mr Pisani-Ferry observed that the first-round effects derived mainly from the composition of foreign trade. All the industrialized countries import goods with a higher emission intensity than their own exports and in this regard France is no exception. Calculations for the United Kingdom show that more than half of greenhouse gas emissions come from foreign trade. Therefore, Mr Pisani-Ferry asked whether foreign trade made a sizeable contribution to emissions content in France and whether an outline of trends in France over recent years could be made available. Mr Cotis replied that INSEE did not at present have a time series, but he welcomed Mr Pisani-Ferry's idea, which would involve applying input-output tables to the structure of a previous year in order to obtain an idea of the trends.

In his introduction Mr Pisani-Ferry recalled that in the past France and Germany had more or less the same trade openness ratio. However, this ratio has now doubled for Germany, while there has been little change in the case of France. That is explained by Germany's much greater commitment to the trade in tasks, which has, however, given rise to a debate in Germany, where this course has been criticized and described as the "bazaar economics". In fact, it is one of the strengths of the German economy that it relies on such specialization for some segments of value added and for the relocation of other segments, in particular to Central and Eastern Europe.

Mr Pisani-Ferry posed three sets of questions to the members of the panel:

- Policy steering: How are we to know which model is preferable? How are different economies to be assessed? Is it better to be the leading world exporter or the leading exporter of value added? Which measures should then be given preference?
- Trade policy: The fact that companies are engaged in import and export modifies governments' positions. Is policy today still structured around exporting industries and importing industries?
- Statistical instruments: What action programme should be launched in order to establish a measurement system that would be more effective in providing indicators adapted to globalization and to the international fragmentation of production chains?

### **Statement by Mr Dominique Guellec**

While in Mr Guellec's view current statistics do not yet provide all the answers to these questions, work is being carried out at OECD on the measurement of intra-company trade and the vertical trade in intermediate goods. He also believed that the work currently under way on input-output matrices was an essential line of enquiry.

Mr Guellec outlined two approaches in the statistical field, whose objective is to ensure more effective monitoring of global value chains and of the real situation of international trade.

### **Improving access to company data**

Foreign trade statistics are statistics compiled by the State. In the context of globalized value chains it is logical for companies to now largely ignore national frontiers. That gives rise to the coexistence of national statistical systems that are sometimes very different, therefore representing a real challenge for statisticians.

OECD is working, through the TEC project, to match company records with foreign trade data. That would make it possible:

- To match up imports and exports between companies;
- to solve the theoretical problems linked to input-output matrices, in particular by discarding the hypothesis of homogeneity (according to which the import content of exports is the same as the import content of domestic consumption goods).

Clearly this approach has its limitations, since it does not take account, *inter alia*, of imports which are re-exported by companies other than those which imported them. By working at the group level it would be possible to recover part of the information.

The main obstacle to introducing such an approach is not of a financial nature (the costs of gathering information have already been covered and the databases have already been matched), but rather of a legal nature. Companies' statistical data are highly protected and outside demands are limited by law, which makes access to such data difficult for researchers and prevents them from properly analysing company strategies. Lawmakers need to examine ways of harmonizing the various requirements by finding a compromise between data confidentiality and guaranteed access to data for research purposes.

### **Solving the problem of intangibles**

There now exists a genuine global market in intangibles, of which we may mention, as an example, the technology market, which gives rise to income flows, certain physical flows and flows of individuals crossing borders, but especially to non-physical flows, through the Internet for example. These different flows do not all appear in the input-output matrices. Indeed, many flows do not actually cross borders, even when they are included in the import price. The fact is that the very concept of the cross-border movement of intangibles is currently poorly defined.

Two conditions must be met if progress is to be achieved in measuring transactions of intangibles: firstly, economists and statisticians must pursue conceptual and methodological studies that are still in their infancy and, secondly, lawmakers must decide whether to impose stronger reporting requirements on companies, which is an essential condition if statisticians are to be able to map transactions more accurately.

### **Statement by Ms Claire Lefebvre**

Ms Lefebvre began by supporting Mr Guellec's appeal for more accurate microdata, which would ensure a better understanding of the trade in value added. The Directorate-General of Customs and Excise (DGDDI) is daily engaged in the real-time collection of highly detailed microeconomic data. Customs statistics have the advantage of providing a breakdown of more than 9,000 goods at the company level. Ms Lefebvre's presentation therefore focused on very specific issues.

#### **Calculation of value added**

A clear path has already been set out by the international organizations with regard to value added statistics: national accounting systems must change their calculation method by 2014 so as to be able to measure that part of trade in value added which takes place without transfer of ownership. For their part, customs authorities will play a complementary role by continuing to publish figures for gross flows - the microdata needed by economists and statisticians will then be retained and protected by the customs authorities.

Customs authorities are also involved in the calculation of value added. Every month difficulties in interpretation arise: customs authorities may need to seek to ascertain whether a particular company has relocated or has changed its distribution circuit, in order to be able to notify its data in trade balance reviews, which are then taken into account in framing economic policy. These difficulties in interpretation are, in fact, reduced by using a value-added approach.

#### **Tolling and processing (contract work)**

It will be possible to deal with the issue of trade processing (what companies declare to customs authorities as being traded without any transfer of ownership to be further worked on abroad or what comes from abroad to be worked on in France) through the use of customs statistics by 2014. The figures show that this traditional form of trade is of small volume: less than 1.5 per cent of French trade involves tolling.

#### **Intra-group trade**

Globalization involves intra-group trade which has to be invoiced mainly for taxation reasons, although this is difficult to evaluate. Ms Lefebvre agreed with Mr Guellec about the advantages of a group-by-group statistical approach, but saw difficulties in working at this level. However, considerable progress has been achieved in this field: INSEE is operating here and Eurostat has built a European data repository for business groups. Customs authorities can already identify some intra-group trade

(as in the case of Airbus, for example, which accounts for 2.7 per cent of annual French imports). To make further progress in this field all the European countries would have to advance together. If the effort is not coordinated, asymmetries could arise, which would eliminate any possibility of making international comparisons.

#### **Specific issues for Europe**

The French customs authorities cannot, however, measure everything and have to deal with sizeable variations which are difficult to monitor or to foresee:

- A company importing electronic components from Asia into several European countries which decides to centralize its European distribution of components in France, may find that the trade in components increases massively in the space of a few months.
- During the influenza A epidemic a company suddenly decided to package its products in Belgium, and this led to a tripling of the trade in vaccines from one month to the next between France and Belgium. In this case, the packaging and distribution centre was centralized in a single European country in order to bring down costs.

Such statistical problems are specific to Europe, since the European market is so fluid. As a result of the disappearance of customs barriers, the monitoring methods are no longer the same; movements are no longer monitored from day to day in the manner practised by customs officials at borders.

#### **Country of origin of goods**

Identifying the country of origin of goods is a very specific problem faced by customs authorities when they need to assign preferential customs duties on the basis of origin. This is a very complex microeconomic task and it is not clear that a general approach will work. The only way of achieving progress in this field would be through close coordination, directed by international organizations, of all trade statistics.

### **Statement by Mr Benoît Coeuré**

Mr Coeuré sought in his statement to demonstrate the importance of the issues raised by Mr Pisani-Ferry with regard to the conduct of public policies.

#### **The priority of rebalancing world payments**

It was Mr Coeuré's view that trade issues should once again be placed at the centre of international concerns in the months to come. The way out of the crisis has led from

a phase of international discussions where it was clear what everyone should do (stimulus measures, banking consolidation, etc.) to a form of joint management of the world recovery and a new cruise regime. Interactions between States, in particular the question of exchange rates, will therefore be a major subject for debate in the G-20 in the next few years. One of the major international priorities is to rebalance international payments. This can be illustrated by two examples:

- If the United States wishes to increase its savings without sacrificing growth, it must export more. But to export more, greater access is required to emerging markets, and that could mean the relaunch of the Doha Round.
- At the European level, the major imbalances now affecting the eurozone lie at the heart of the debate: in order for a rebalancing to be achieved, a prior analysis of current account balances and trade competitiveness within the eurozone is indispensable. However, there are problems in measuring trade within the eurozone. There has been a loss of data in recent years, at a time when such measurement is crucial, even in a single market such as the European Union.

The need for effective measurement of trade in order to be able to conduct an appropriate trade policy

With regard to world governance, trade is one of the areas that most lend themselves to experimentation and a creative process of trial and error at both the multilateral and bilateral levels. In choosing between multilateralism and regionalism it is crucial to measure trade accurately, since there is a need to be able to measure the offensive and defensive interests of Europe vis-à-vis the emerging economies or to know how to enforce rules of origin in the context of trade within a given area. However, as regards the issue of measurement, there is lack of agreement between:

- On the one hand, macroeconomists and financial experts who see these issues in terms of the balance of payments. The framework defined by the G-20 is limited to monitoring current account balances, but ignores the trade itself: there is a need to focus on gross flows and re-examine them in order to understand their dynamics.
- On the other hand, companies and States which, in pursuing their trade policies, are mainly concerned with business competitiveness, the creation of value or the location of employment. At the national level, it is the objective of the policies carried out which is the main criterion: thus, in France, it is the creation of value on the national territory. These criteria are different from those of macroeconomists.

The conduct of an effective government policy on international trade requires specific knowledge of where value is located. Thus, in the case of France, the criterion used when granting public guarantees through COFACE is the existence of a “French share”, that is to say, of value added in France. However, more and more atypical cases have arisen. When a company wishes to expand into an emerging market, it must form partnerships with companies in the emerging countries and establish bridgeheads there. In such situations, it must be ready to accept that there will be less value in France today in order for there to be more tomorrow. If strategic errors are to be avoided, not only must there be a dialogue with the companies concerned to enable them to demonstrate the practicality of their projects, but statistics are needed to ascertain where companies locate their value chains and to estimate the economic impact on employment in France.

### **Strengthening the statistical link between microeconomic and macroeconomic data**

Input-output tables are now indispensable for analysing the import content of exports and for the reprocessing of microeconomic data. Microeconomic and macroeconomic approaches need to be combined in order to understand the relationship between foreign trade and companies’ accounts.

With regard to microdata Mr Coeuré made two additional points in favour of:

- *A breakdown based on company size:* the instruments of government policy will vary greatly according to the size of the company it is dealing with.
- *An exploration of the link between export and innovation:* econometric studies show that companies which export, in particular the SMEs, are innovative companies. The main instrument of trade policy in France is, in actual fact, the tax credit for research. An analysis of value chains relating to technological activities and soft activities is therefore very useful.

### **Statement by Mr Patrick Messerlin**

Better information should lead to better understanding; it is this statement that Mr Messerlin wished to illustrate with a few specific examples.

### **Macroeconomic treatment of trade-balance issues**

Economists emphasize that the trade balance is a macroeconomic problem, but politicians do not follow suit and continue to see it as a trade policy problem.



Between 1995 and 2007 European Union imports from China rose from 5 per cent to 20 per cent of total imports which, at first sight, looks like a tidal wave of Chinese goods. However, if we add together imports from ten Asian and American countries (China, Japan, Republic of Korea, United States, Hong Kong, etc.), we see a fall in their share of total imports, from 50 per cent in 1995 to 45 per cent in 2007. That means that China apparently only acts as a temporary hub for the trading of goods.

The issue of bilateral trade balances has taken on huge proportions because they are not considered from a value-added standpoint. The United States Congress sees this as a foreign exchange issue, whereas in fact it is a much broader, macroeconomic issue. Such statistics would help to prevent dangerous mistakes.

### **A better understanding of the impact of government decisions**

Mr Messerlin gave two examples that illustrate the fact that political decisions are sometimes taken on the basis of uncertain, incomplete or even erroneous information:

- *Anti-dumping measures (against imports sold at very low prices):* calculations show that the share of European value added in cheap imported shoes is 55 per cent (excluding the distribution circuit). When Europe bans imports of cheap Chinese shoes by an anti-dumping measure, it therefore incurs a significant loss. It is true that 95 per cent of the actual production of the shoes takes place in China, but the design is Swedish, the leather is Italian, and the logistical distribution channels and marketing are European. So it is not just the goods themselves that must be taken into account: the impact on services of such imports of cheap shoes is considerable. If we add services to the equation, the European share in the value added of the shoe is 80 per cent. Such calculations could provide the basis for a renewed call for negotiations on services in the context of the Doha Round.
- *Subsidies:* when Europe grants a subsidy of one euro to Airbus, that raises its production and in turn increases its needs for engines, some of which are made in the United States. A part of the one euro subsidy therefore goes to US engine makers, which in turn helps to finance the US economy.

Similar examples may be found with regard to government procurement and the CO2 market. There are therefore whole areas in which over and over again information on value added genuinely clarifies the issues. The main lesson of the value-added approach is that the whole world is interdependent, and that any attack on others is an attack on oneself.

### **A “return to calm”**

The way in which exporting and importing industries are structured is a matter which has now been somewhat overtaken by events, since such industries resemble one another more and more. States do not change their customs duties for this reason; they prefer to protect existing flows. However, the system is not permanent and if one State decides to raise its tariffs, all the others could take similar action. In describing the current situation there is frequent mention of the circumstances in the United States in the 1930s, but it would be more accurate to refer to the European States which, from 1925 onwards, began to undermine the system, leading to a gradual return to protectionism until the whole system collapsed. In Mr Messerlin’s opinion, it is high time for statistics to shed light on this area.

### **Discussion**

#### **A suitable action programme**

In initiating the discussion Mr Pisani-Ferry referred to the 2010 Nobel Prize in Economic Sciences, which was awarded to economists who had analysed the labour market in terms of gross flows and not net flows - separately analysing the extent to which companies create jobs in a given period and the extent to which they destroy them, though without directly studying the balance. This analysis has profoundly changed the understanding of the labour market. Studies on trade in value added have followed a similar course in that the main aim has been to find the right level of analysis of trade in respect of gross flows and then to determine the implications for understanding the economic phenomena. The lesson which emerges from the various statements is that different levels of analysis need to be combined: the company level, the product level and aggregate levels that take accounts of the nature of the flows.

The question of what action programme would be desirable remained unanswered. Mr Pisani-Ferry asked the participants for their perspective:

#### **• Mr Guellec’s view:**

Statisticians are already able to use microdata and employ them as a complement to input-output matrices. However, much greater use should be made of administrative data (company register, customs data). Since the data are already available, the necessary outlays are much less than those associated with new statistical enquiries. According to Mr Guellec, that is a short- or medium-term option.

The measurement of intangibles is still a problem which can only be solved within a period of five to ten years, especially since corporate rules on data transmission are inadequate. It is for society as a

whole to consider what resources it is prepared to commit to the collection of the data that it needs and what individual costs it wishes to impose on companies.

- In **Mr Messerlin's** view, emphasis should be placed on the gathering of data relating to products or the policies envisaged, in order to show more clearly the ineffectiveness of policies such as anti-dumping measures and to provide better guidance for the choices made by decision-makers. That should be done at the stage when public decisions are being examined in detail.

- **Mr Coeuré** agreed with Mr Messerlin: there is a need to refine the economic tools, whose failing is that they do not properly correlate microdata (regarded as anecdotal by economists) and macroeconomic data. Mr Coeuré believed that States were currently poorly equipped, at the institutional level, to undertake such correlation. Far-reaching decisions are currently taken on the basis of guesswork, as in the case of the G-20, which took the view that the collapse of trade was primarily a trade finance issue, a view which had absolutely no economic or statistical basis. That makes it necessary to establish an institutional structure that will enable decisions to be taken on the basis of an accurate and correct analysis.

- **Ms Lefebvre** considered that it was important to continue gathering high-quality information. In order to convince companies and institutions reluctant to accept the need for such data collection, it would be useful, in her opinion, to calculate the economic loss resulting from poor quality statistics that do not allow informed decisions to be taken.

- **Mr Cotis** came back to the need to have better mapping of the relevant groups in Europe. Thus, he pointed out that France presided over a European working group in this field. The work, which is of considerable complexity, is largely exploratory. He believed that it was by no means certain that the resources necessary for such mapping would be released. Thus, DG Enterprise of the European Commission had stressed the need to reduce the statistical burden on companies. The few advances that have been made are therefore taking place against a background of constraints.

### **The consequences of the reform of the System of National Accounts (SCN) in 2008**

According to **Mr Michel Sérurier** the reform of the SCN undertaken in 2008 resulted in the destruction of some of the input-output data, the need for which had been highlighted in the course of the Conference. For the five aspects considered - structure of the production system, financial aspects, value-added flows, quantitative flows

associated with transport problems, and pollution flows - appropriate input-output tables were necessary. There was an urgent need for economists and statisticians to communicate their needs so that national accounts could respond to them.

**Mr Escaith** was more optimistic, however, taking the view that the debate was not yet closed. Now that the implementation phase of the new SCN rules has begun, it is clear that neither the developing nor the developed countries wish to lose track of their basic economic data. Many experts have suggested that gross measurement and net measurement should be carried out in parallel. This is, in fact, a common-sense approach: all the necessary crude information should be collected so as to make it available to analysts, who can then use what data they wish. The purely financial approach dominant in the 1990s, which gave priority to net balances, had become somewhat obsolete since 2008 as a result of the economic and financial crisis.

**Mr Pisani-Ferry** asked Mr Escaith whether the WTO was thinking of taking a direct initiative in this field. According to Mr Escaith, the function of WTO statistics is to help negotiators examine the issues which are on the table. It was in this context of monitoring and of assisting decision-making that Pascal Lamy initiated the analysis of trade in value added. It is the WTO's aim, therefore, to work with other multilateral organizations in order to provide more information to States without disregarding traditional statistics. It is also important to extend statistical coverage to the least developed countries, so as to gain a better understanding of the links between trade and development.

## IV. General conclusion by Mr Jean Arthuis: the response of political leaders to globalization

IV

In concluding the Conference, which had its roots in discussions between Pascal Lamy and the Senate Finance Commission and in the study by the Economic Studies Unit of the Senate, Mr Arthuis reaffirmed his strong interest in the subject and in the issues raised by the participants. He considered that the day's debates had provided an ideal opportunity to discuss the usefulness of fine-tuning the instruments for the management of trade statistics.

### **Do political leaders have the right instruments for managing the economy?**

"How can we do things better when we don't really know what we're doing?" Leaders whose task it is to manage public policies ask this question against a background of economic imbalances and systemic crisis which have led to a dramatic fall in confidence. Self-regulation, which was thought to be highly effective in the financial and banking fields, has clearly shown its limitations. States have become, in fact, the final guarantors of the system. Mr Arthuis observed that there had in fact been improvements: public accountants, encouraged by Eurostat, now submit honest accounts (even though there is still room for improvement - in particular, as regards the accounts that the States of the European Union exchange among themselves).

Political leaders are aware of the need to have relevant information for decision-making, but there is a tendency to multiply the indicators, without really identifying those which enable decisions to be taken. While the macroeconomic line of approach by itself often helps to calm fears, it is the responsibility of political leaders to manage the consequences of globalization in their countries in terms of social cohesion and employment, consequences which receive little emphasis under the macroeconomic approach. This is not an easy task: the creation of value added requires competitiveness, without which it is impossible to create employment. Parliamentarians have a special contribution to make by passing laws which preserve both competitiveness and social cohesion. In this context it is essential that statistics closely reflect economic reality.

### **A more extensive use of value added**

In Mr Arthuis's view the possession of more accurate data on value added opens up new opportunities for political leaders:

- Value added may provide a good tax base. The new *Contribution économique territoriale* (CET) (Regional Economic Contribution), the result of the reform of the business tax, has a "value added" component. However, it may be a delicate task to identify value added: in the case of the CET, it is difficult to distribute it among 36,000 communes.

- COFACE can base its strategies on value added, as long as that is compatible with European rules.

- As regards research and development, it would be advantageous to base some contributions on value added in order to lighten the burden of others, in particular social contributions on the salaries of research workers. Mr Arthuis believed that the results could be as positive as in the case of the tax credit for research.

### **Collection of microdata whose usefulness can be justified**

Mr Arthuis welcomed the emphasis placed on the need for companies to make information available. It is important to recognize that an efficiently functioning microeconomy cannot but benefit the macroeconomy. Mr Arthuis noted the repeated appeals for the formulation of legal instruments that would help to eliminate constraints and give access to more accurate corporate data. However, that could only be done if the legislature could make it clear to each and every company that the information gathered would have a purpose and would enable it to take good decisions. It may well be the case that over the years the explanations provided by political leaders have been of very uneven quality. It is clearly necessary to restructure existing arrangements in order to compel States to produce statistics that are enlightening. That would make it possible for public leaders to fully assume their responsibilities without taking refuge in over-dramatization and illusionism. According to Mr Arthuis, the WTO could, within the framework of the G-20, play a genuinely prescriptive role with regard to the collection of information on value added.

Political leaders must ensure that their decisions are guided by technical expertise, so that their decisions are practicable. Mr Arthuis therefore called for further conferences of this kind to be held periodically in the future.

## A. Annex 1 - Address by Mr Jean Arthuis, President of the Senate Finance Commission

Mr Director-General,  
Ladies and Gentlemen;

Together with Pascal Lamy, we are very happy to welcome you here today in the Palais de Luxembourg for this symposium devoted to the measurement of international trade in value added. I should like to begin by thanking you for your attendance here - in particular those of you who have come a long way despite transport difficulties.

### **Political leaders must concern themselves with subjects regarded as “technical”**

It is clearly not by chance that we have chosen to hold this event on an apparently highly technical subject in the French Senate - an eminently political body.

The fact is that for a long time political leaders, in particular parliamentarians, have kept aloof from subjects perceived as excessively technical.

That has been the case, for example, with such issues as financial regulation and subjects relating to accounting rules or to the prudential ratios which credit institutions must apply.

Until recently these were areas reserved for the “technical” experts, that is to say, professionals or former professionals, committees or regulators.

Clearly such technical experts have a form of legitimacy, i.e. an intimate knowledge of the subjects they are dealing with. However, this way of operating has sometimes led to a form of exclusiveness, to widespread self-regulation in some fields and even to the establishment of sectoral regulations outside the democratic arena, even though such rules may have real consequences for the whole of society. Furthermore, especially when a problem arises, rather than the technical experts it is the political leaders that citizens hold to account for their actions (or lack of action). As is normal in democratic societies, it is the elected representatives who have the responsibility for establishing a framework for defining the rules or, if necessary, repairing the damage.

It is therefore healthy (and even essential) that politicians too should concern themselves with “technical” subjects and not just when problems flare up. Far from remaining above the fray, elected representatives need to “get their hands dirty”.

This is the thinking behind the establishment of a body such as the *Office parlementaire des choix scientifiques et techniques* (OPECST). And that too, at a more

modest level, is the idea behind the organization of this symposium taking place today at the Palais du Luxembourg.

### **The figures on which political decisions are based must be seen to be reliable and reflective of reality**

However, political leaders are not generally experts and, in order to come up with rational arguments and formulate decisions, they need to have a clear idea of the real situation. In the economic field there are obviously figures and statistics which provide a framework for organizing their ideas. In more general terms, the citizens themselves need, at least in the economic field, to be able to draw on undisputed and reliable data that will enable them to grasp the real issues at stake.

Thus, the “major indicators”, which in the eyes of political leaders (and the general public) provide a picture of the economic health of a country must be beyond question to all.

But that is not the case.

That fact is beginning to be understood, even among the general public, with regard to the GDP. In 2008, the President of the Republic, Nicolas Sarkozy, set up, as you know, the Commission on the Measurement of Economic Performance and Social Progress; it was chaired by Joseph Stiglitz and its proceedings were coordinated by Jean-Paul Fitoussi.

Without going into an analysis of the conclusions of this Commission (which are to be outlined this afternoon by Jean-Philippe Cotis, Director-General of INSEE, in his statement), let us say only that its composition, the quality of its work and the response that the Head of State has given to its conclusions have launched the debate and begun to popularize the idea not only that the way in which GDP is calculated deserves to be reviewed, but that the economic performance of a country cannot be summed up in this single indicator.

### **Foreign trade figures are themselves open to question**

On the other hand, foreign trade figures seem “naturally” and intuitively to be more objective, especially when they refer to the trade in goods.

However, as your presence here today shows, when we dig a little deeper, we see that changes in the world and in industrial processes have led to considerable biases that may significantly distort our understanding of the real state of affairs.

Pascal Lamy, who directs an international organization primarily concerned with such problems, brought this issue to the attention of the members of the Senate

Finance Commission when we had the honour of hearing him speak last February. He then clearly explained to us that the measurement of international trade flows is significantly distorted by the current methods of calculation used, which measure gross flows, whereas statistics should rather take account of value-added flows between States.

He emphasized how this bias stems from the international division of labour, since a single product could be manufactured or assembled in several countries and could then appear several times in world trade figures. To give a trivial example of this concept, Chinese steel used in the manufacture of a bolt in Viet Nam, which would then be used in the manufacture of an engine made in Germany and which would finish up in a rocket assembled in France, would be counted, in current statistics, on each occasion that it crossed a border, while we can see clearly that in terms of value added it should be counted only once.

Pascal Lamy rightly concluded, at that hearing, that the real flow of traded goods and services is much smaller than official statistics show and that, in addition, the value-added content of the exports of different countries is far from being the same, which also distorts official trade balance figures. It is therefore likely that the average value added of exports of a country such as the United States is very different from that of the exports of the same amount (in turnover) of a country such as China. Consequently, a different approach could very considerably modify such a highly significant figure as the United States deficit with China.

We can see therefore that, behind an apparently technical debate which is a priori the preserve of experts, it is really our understanding of globalization which is at stake:

- Our understanding of the scale of the (indisputable) globalization of our economies;
- our understanding of the respective weight of each country in this new context;
- our understanding of the balances and imbalances of economic relations between countries.

As a result, the general public (and, I should add, political leaders) react on the basis of simplistic data, and this, let us be clear, poses a genuine political problem and, indeed, a problem of democracy. While there is no question of denying the existence of imbalances, a debate on a subject such as the level of the yuan should be conducted on the basis of clear figures and that, alas, is not the case today.

### ***Origins of the Conference***

It was against this background that Pascal Lamy and I conceived the idea of holding this Conference. We believed it to be absolutely essential to shed light on these problems and to take stock of current thinking in this area both in France and at the international level.

I know that some of you have already given a lot of thought to this subject. Within the French Parliament, the Economic Studies Unit of the Senate had itself already published a report clearly raising this issue as far back as July 2009. That study clearly showed that, in a world in which interdependence between economic areas is growing, foreign trade statistics have become strategic, since they alone enable us to understand the strengths and weaknesses of countries and to understand the logic and stability of the international economic system. It also revealed that, unfortunately, foreign trade statistics appear to be less and less soundly based and meaningful. That report concluded that the new international division of labour requires new foreign exchange statistics.

Starting from these foundations, I hope that this Conference will help everyone to move forward and will play, at its own level, a role in raising the awareness of public authorities, as well as of the general public.

### ***Organization of the day's proceedings***

Our proceedings will be divided into two half-day sessions.

Patrick Artus, Director of Economic Studies at Natixis and member of the Council of Economic Analysis, will chair a morning session on "International and French experience". Four statements will help us to assess the experience of France and Germany and the views of the OECD and the WTO.

This afternoon, with Jean Pisani-Ferry, Director of Breugel and also a member of the Council of Economic Analysis, acting as moderator, we shall examine the "Statistical and economic implications of globalization". This topic will be covered by three statements, drawing on the work of the WTO, the Directorate-General of the Treasury and INSEE, to be followed by a roundtable discussion which will conclude our proceedings.

Our objective, as you will have understood, is both simple and ambitious: to devise a more "realistic" method of measuring international trade, in order to produce statistics which provide clear criteria by which political leaders and citizens can assess globalization.

From this point of view, is the value-added approach the right one or is it itself biased? What are the methodological challenges of moving from one accounting method to another (they could be considerable)? Finally, if this line

of enquiry is useful, what time frame might be envisaged in order to develop the tools we need at the national, European and global levels?

There is plenty here to fill our day's discussions, which will undoubtedly not be the last word on these subjects, but which will, I hope, indicate the way forward.

I should like to thank you again for your attendance and your participation and I now give the floor to Pascal Lamy, Director-General of the World Trade Organization.

## B. Annex 2 - Address by Mr Pascal Lamy, Director-General of the World Trade Organization

It is a great honour for me to be here among you today to open, together with my friend Jean Arthuis, this conference on a subject that is particularly close to my heart.

It must be fairly unusual for the Senate to host, within its ornamental walls, a statistical seminar. But that we should meet here to examine the statistical aspects of the measurement of foreign trade in the light of the new challenges brought about by globalization is an all-time first, and I am grateful to the Senate for realizing the importance of the subject. The challenge is not only for statisticians, but also, and above all, for the decision makers responsible for ensuring the proper conduct of domestic and international policy.

Public affairs and official statistics have long been good bedfellows. The original idea was to draw up an inventory of the Prince's wealth in an essentially agrarian economy. Statistical production has evolved according to need in an economy that became increasingly complex following the industrial revolution and the advent of the service society - the intangible products of human activity that are a headache not only for statisticians, but also for trade negotiators. But national accounts continue to be based on the idea of an inventory of what is "ours" and what is "theirs" (in technical language, the notion of "resident" and "non-resident" in establishing the country's balance sheet, its balance of payments).

When the needs of economic and social policy change, statistics must follow along, and better late than never. It took the 1929 crisis for national accounting, invented by the Physiocrats in the 18th Century, to take over, after the second world war, as the main economic frame of reference for both decision makers and statisticians. As a result, analysts had better statistical tools for testing their theories and coming up with new theories: while analytical progress leads the way for statistics, it is statistics, in their turn, that correct and alter our perception of economic and social phenomena, enabling theory to put forward new interpretations.

It may not be a coincidence that the recent global crisis, unprecedented in its intensity since the Great Depression, revived analysts' interest in improving the statistical instruments on which States rely in analysing economic trends and determining what policies to adopt. The fact that statistics rely on analytical progress to improve their figures and that political decision makers use them to guide their choices enhances the public debate. More often than not, these statistical improvements take place progressively thanks to greater conceptual precision, to increased efficiency in the methods used, and to added efforts to produce data.

In approaching the matter that brings us together here today, what we will be doing is taking a quantum leap and examining, from a different angle, two of the underlying concepts of international trade and balance-of-payments statistics, namely the notion of country of origin, and the concept of resident as opposed to non-resident.

In the 19th Century, when Ricardo developed what was to become the foundations of international trade theory, countries exported what they produced. In fact, the industrial revolution took root in countries that had coal mines and iron ore. A Portuguese entrepreneur importing a steam engine from England would know that everything from the steel of the wheels to the boiler pressure gauge came from the United Kingdom. Similarly, an English club importing Port wine for its members could be sure that it came from Portugal.

Today, Port wine is still of Portuguese origin. Thanks to progress on registered designations of origin, the English importer today is in fact more certain of this than his 19th Century counterpart. However, the concept of country of origin for manufactured goods has gradually become obsolete as the various operations, from the design of the product to the manufacture of the components, assembly and marketing have spread across the world, creating international production chains. Nowadays, more and more products are "Made in the World" rather than "Made in the UK" or "Made in France".

Most likely "Made in China", you might add!

This is what many people today mistakenly believe. What we call "Made in China" is indeed assembled in China, but what makes up the commercial value of the product comes from the numerous countries that preceded its assembly in China in the global value chain, from its design to the manufacture of the different components and the organization of the logistical support to the chain as a whole. In other words, the production of goods and services can no longer be considered "monolocated", but rather, "multilocated". As a result, the notion of "relocation", which made sense in the past when referring to the production of a product or service at a single location, loses much of its meaning. If I relocate a segment of the production chain for reasons of economies of scale, and others relocate to my area for

the same reasons, the impact on my total value added, i.e. roughly speaking, my employment, may be neutral, negative or positive; and nowadays, it is this balance that we have to look at very closely. If we continue, in this context, to base our economic policy decisions on incomplete statistics, our analyses could be flawed and lead us to the wrong solutions.

For instance, every time an iPod is imported to the United States, the totality of its declared customs value (150 dollars) is ascribed as if it were an import from China, contributing a bit more to the trade imbalance between the two countries. But if we look at the national origin of the added value incorporated in the final product, we note that a significant share corresponds to reimportation by the US, and the rest to the bilateral balance with Japan or Korea which should be allocated according to their contribution to that added value. In fact, according to American researchers, less than 10 of the 150 dollars actually come from China, and all the rest is just re-exportation. In the circumstances, a re-evaluation of the yuan - a topic which is very much in vogue these days - would only have a modest impact on the sales price of the final product and would probably not restore the competitiveness of competing products manufactured elsewhere.

Similarly, the statistical bias created by attributing the full commercial value to the last country of origin can pervert the political debate on the origin of the imbalances and lead to misguided, and hence counter-productive, decisions. Reverting to the symbolic case of the bilateral deficit between China and the United States, a series of estimates based on true domestic content cuts the deficit by half, if not more.

This impression is confirmed by other figures, if we accept to “debilateralize” them: if we look at the US trade deficit with Asia rather than its bilateral deficit with China, we note a remarkable stability over the past 25 years at something like 2 to 3 per cent of the United States’ GDP.

As for the impact on employment - understandably a rather sensitive issue in these times of economic crisis - once again the result can be surprising. Reverting to the case of the iPod, another study by the same authors estimates that on a global scale, its manufacture accounted for 41,000 jobs in 2006 of which 14,000 were located in the United States, 6,000 of them professional posts. Since American workers are more qualified and better paid, they earned more than 750 million dollars, while only 320 million - less than half - went to workers abroad.

In this example, case studies have shown that the innovating country earns most of the profits; but traditional statistics tend to focus on the last link of the chain, the one which ultimately earns the least. Don’t get me wrong, I am not saying that this is always the case and that relocations always create more jobs than

they destroy. You will probably have the opportunity to discuss the matter here.

But I simply wanted to highlight the paradoxes and the misunderstandings that arise when new phenomena are measured using old methods. Statistical enquiry experts know very well that “if you question the wrong person, you will receive the wrong answer”. Similarly, if you analyse a phenomenon using the wrong “measurements”, you will reach the wrong conclusions.

As pointed out in a study published in 2009 by the Senate on the measurement of France’s foreign trade, “traditional measurement of foreign trade alone no longer suffices to explain how [the country] fits into the world economy”. In other words, the time has come to explore new channels so that accounting and statistical systems can take account of the new geography of international trade in an economy which, in the words of the American Tom Friedman, has flattened under the influence of globalization and internationalization of production relations. In today’s world, the old mercantilist notion of “us” against “them”, of “resident” against “rest of world”, has lost much of its meaning.

However, to avoid any misunderstandings on the WTO’s objectives in this new area of research, I would like to say to the statisticians here today that we are certainly not “deconstructing” the national and international statistical system or “displacing” certain elements of that system. On the contrary, we are trying to “relocate” and “reorganize” in a more integrated context the sparse information available today in different and separate subsectors of the existing systems. Although it is true that today, the notion of resident/non-resident has lost some of its relevance when it comes to understanding the microeconomic reality of world value chains, the fact remains that it is the concept of national territory that counts when it comes to public policy. Similarly, national accounts must remain the unifying framework for the different statistical subsystems.

The challenge, then, is to find the right statistical bridges between the different national accounting systems in order to ensure that international interactions resulting from globalization are properly reflected and to facilitate cross border dialogue between national decision-makers. This reconstruction work, involving a more structural incorporation of national trade, industrial and employment statistics in a globalized vision, clearly has to rely on reinforced statistical cooperation among multilateral organizations. And I stress, here, the coordinating role that has to be played by organizations like the OECD, Eurostat, the specialized United Nations Agencies and the Monetary Fund - not to mention the WTO - in this revision project.

Let me conclude by thanking, once again, the Senate’s Financial Commission for taking the initiative of organizing this conference, and all of the participants who were

willing to share their knowledge and experience with us. We need only consult the speaker's list to see that the discussions will be on a high scientific and technical level. The reputation for wisdom associated with the discussions of this illustrious institution serves as a guarantee that high-quality technical proposals will ultimately fall upon attentive and competent ears.

Finally, I would like to thank the participants who responded to the joint invitation by the Senate and the WTO, in particular the representatives of the permanent missions and observers who travelled from Geneva or from their capitals for this occasion. Their presence here bears testimony to their interest in these discussions that are so crucial to understanding international trade today, and I am certain that your work here in the Senate will help to enlighten our debates in Geneva.







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