ESA/STAT/AC.234/23
10 May 2011

UNITED NATIONS
DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS
STATISTICS DIVISION

Expert Group meeting on International economic and social classifications
New York, 18-20 May 2011

Measuring trends in ICT trade: From HS2002 To HS2007 / ICT product definition

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Organisation for Economic Co-operation and Development

10-May-2011

English - Or. English

DIRECTORATE FOR SCIENCE, TECHNOLOGY AND INDUSTRY
COMMITTEE FOR INFORMATION, COMPUTER AND COMMUNICATIONS POLICY

DSTI/ICCP/IIS(2010)5/FINAL
Unclassified

Working Party on Indicators for the Information Society

MEASURING TRENDS IN ICT TRADE: FROM HARMONISED SYSTEM (HS) 2002 TO HS 2007

English - Or. English

JT03301547

FOREWORD

This paper presents a new list of ICT goods for trade analysis that takes into account the new OECD definition of ICT products (2008) and the changes in the international classification of trade in goods (HS 2007). The new list, developed by an expert group of the Working Party on Indicators for the Information Society (WPIIS) and shown in the annex table, takes into account comments received by delegations up to 13 September 2010. As a result of the discussion, the correspondence table originally proposed was slightly amended mainly by excluding six codes and including the Video game consoles code [950410] in the HS 2007 and 2002 lists. The WPIIS at its meeting in June 2010 agreed to recommend the declassification of the paper to the Information, Computer and Communications Policy (ICCP) Committee.

The ICCP Committee agreed to make the document publicly available in October 2010. It is published under the responsibility of the Secretary-General of the OECD. This report was prepared by Frédéric Bourassa of the OECD's Directorate for Science, Technology and Industry.

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MEASURING TRENDS IN ICT TRADE: FROM HS 2002 TO HS 2007

Introduction

The production of ICT equipment for infra-structure and consumption is characterised by a value chain fragmented across different countries and areas of the world. Trade in ICT goods concerns technologically advanced goods that one country is producing and exporting. It also represents opportunities for industrialised countries which are seeking to convert and develop their industrial activities as well as for emerging or developing countries to find a way to be inserted in the globalised production chain. For all these reasons, it is important to be able to accurately measure the flows of trade in ICT goods.

Two recent changes in international statistical standards call for a revision of the ICT trade measurement. First, in 2008 the OECD released a new definition of ICT products and the ICT trade classification needs to be updated accordingly. Second, the change in trade classification (from Harmonized System (HS) 2002 to HS 2007) has introduced a break in time series. As a result, ICT trade statistics before 2007 are not always comparable with ICT trade statistics from 2007 onwards.

In order to deal with these two issues, in 2009 the Working Party on Indicators for the Information Society (WPIIS) set up an expert group with the mandate to develop a correspondence between HS 2002 and HS 2007. The expert group is composed of Daniel April (Canada), Martin Mana (Czech Republic), Aarno Airaksinen (Finland), and Sheridan Roberts, consultant.

This paper presents the new definition of ICT trade and the correspondence between HS 2002 and HS 2007 developed by the expert group (see Annex table). The first part develops a classification of ICT trade in goods following the new OECD definition of ICT products and the changes in the HS classification. The second part assesses recent trends in ICT goods trade based on the proposed classification and tries to evaluate the reliability of the new time series pattern.

The WPIIS discussed and approved the revised classification of ICT goods, as contained in the Annex to this document. The Information, Communications and Computer Policy (ICCP) Committee declassified the paper following the October 2010 meeting.

1. Revised measurement of ICT goods international trade

1.1 The 2008 ICT product definition

The first definition of ICT products was established by the WPIIS in 2003, based on a list of 6-digit items according to the HS 1996 and HS 2002. The second definition of ICT products was adopted in 2008, based on the then newly released second revision of the Central Product Classification (CPC rev. 2). The new definition includes ICT goods, ICT services and the first content and media product classification. The definition is published in the Guide to Measuring the Information Society 2009. [*www.oecd.org/sti/measuring-infoeconomy/guide*]

The scope of the 2008 ICT product definition is narrower than the 2003 definition. The following sentence was deleted from the guiding principles: "… use electronic processing to detect, measure and/or record physical phenomena or to control a physical process." Therefore, the value of trade in ICT goods would be smaller according to the new ICT product than it was according to the old definition.

In addition to a change in scope, the classification used for the 2008 ICT product definition (CPC rev. 2) is not the same as the one used for the measurement of ICT trade (HS 2007). Therefore, a correspondence table was developed and published in the Partnership on Measuring ICT for Development's Core ICT Indicators, to convert CPC rev. 2 into ICT HS 2007.[1]

Figure 1 compares the value of trade in ICT goods for the OECD countries based on the 2008 and the 2003 definitions of ICT products. The two aggregates follow the same trend but in 2006 the value of trade in ICT goods based on the new definition accounted for only 90.5% of the value based on the old definition. This is due to the fact that the 2008 ICT product definition is narrower than the 2003 definition.

If we added back the products left out by the new ICT definition (*i.e.* "old" ICT products), total trade in goods would get closer to the original value based on the old ICT product definition. However, some differences would remain due to the imperfect correspondence between the new product definition (2008), based on CPC rev. 2 and HS 2007, and the old product definition (2003), based on HS 2002 and HS 1996.

On the basis of the above observations, it was proposed and accepted to:

- Change the definition of trade in ICT goods according to the 2008 definition of ICT products, based on the correspondence table from CPC rev. 2 to HS 2007.

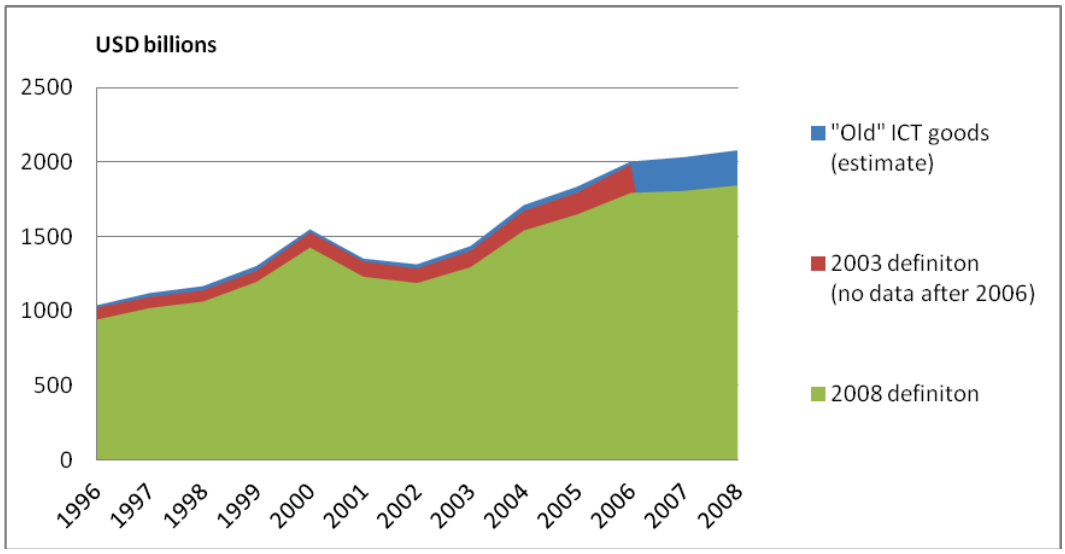
- Re-compute the times series of trade in ICT goods before 2008 based on the 2008 definition.

- Provide an estimate of the value of "old" ICT goods over 1996-2008 as a mean to reconcile the time series based on the old and the new definitions and to use exclusively the new definition of trade in ICT goods from 2008 on.

In order to re-compute the past time series, it is necessary to convert trade data from the HS 2007 into the previous versions of the HS. Therefore, the work was conducted from the latest revision of the HS back to the oldest one: CPC rev. 2=> HS2007=>HS2002=>HS1996.The methodology for this conversion is explained in the following section.

1. The "Core ICT Indicators 2010" published by the Partnership on Measuring ICT for Development provides two parallel lists of ICT goods according to CPC rev. 2 and HS 2007. The difference which exists between the Partnership's Core ICT Indicators table and the OECD ICT goods definition is the inclusion of the video games console code [HS 2007 – 950410] in the OECD's list. The inclusion of this code was decided following a consultation with the WPIIS delegates between July and September 2010. The last comment was received on 13 September 2010.

Figure 1. Comparison between the old and new ICT product definition in terms of value of total ICT goods trade for OECD countries, USD billion



Source: Joint OECD-UNSD ITCS (International Trade by Commodity Statistics) database, February 2010.

1.2. Usage of the HS classification for measurement of international trade in goods

The Harmonized System (HS) classification is commonly used for the measurement of trade in goods as all the world's countries customs are declaring their exports and imports using this classification. This classification allows disaggregating trade in goods to a 6-digit level, which represents a single good or a small group of goods. The HS classification is used for trade in goods only while trade in services is measured through the Extended Balance of Payments Services (EBOPS) classification. The OECD's International Trade in Commodity Statistics (ITCS) database or the UN's Comtrade database uses the HS classifications among others.

The ICT goods definition is a collection of 6-digit items selected according to the following principle: "ICT products must primarily be intended to fulfill or enable the function of information processing and communication by electronic means, including transmission and display".

1.3. Correspondence problems from the adoption of the HS2007 classification

In order to stay "up-to-date in the light of changes in technology or in the patterns of international trade"[2] the HS was revised in 2007 leading to a major disruption for time series based on the ICT goods definition. Some codes were deleted, others were added or split as new ICT goods appeared or existing goods gained in importance. Some codes were merged with other codes in order to better reflect the trade situation. The correspondence between HS 2002 and HS 2007 at a 2- or 4- digit level are fairly easy and raise no problem. However, at the 6-digit level, which is necessary for the identification of ICT goods, a fair number of correspondences are 'one to many', 'many to one' or 'many to many'. As a result, the conversion from HS 2002 to HS 2007 becomes more problematic.

2. From the preamble of the HS Convention

1.4. Solutions proposed to solve the break into time series problem

The guiding principle for this work was to keep consistent time series in ICT goods trade in order to carry out analysis. It was also important for us to be able to break down the ICT goods into the smallest possible time series in order to be able to analyse the content of five ICT groups.

The solution was to create what we will call 'Bloc of items time series' (1.4.1). We also address another problem which causes major breaks in time series: the United Kingdom VAT fraud (1.4.2). In a third paragraph we will explain the most worrying problem of breaks in time series that exist in this correspondence table: that of photocopy machines and printers (1.4.3). In the last paragraph we propose splitting the large 'miscellaneous group' of the 2008 ICT product definition into two groups and creating a new group for electronic components (1.4.4).

1.4.1. Creation of item blocs

Before the implementation of the HS 2007 it was possible to have consistent time series at the 6-digit level when using the HS1988, HS 1992, HS1996 and HS 2002 classifications. As mentioned above, it is no longer possible due to changes in the content and numbering of the 6-digit items of HS2007. The numerous 'many to many' correspondences between HS 2002 and HS 2007 caused important breaks in time series at the 6-digit level. Figure 2 is a simple illustration of the problem we are facing. As an example we take the items: HS2002 852812 and 852813. First we notice that these numbers no longer exist in the HS2007 classification. The correspondence table provided by the World Customs Organization which is responsible for the HS classification, gives the equivalence of these two items for HS 2007 : HS2002 852812 = HS 2007 852871 and 852872; HS2002 852813 = HS 2007 852871 and 852873. The problem here is that one item is included in both equivalences: 852871. Therefore it is no longer possible to have a straight correspondence for either of these two 6-digits item. In Figure 2, Step B shows the impossibility in having distinct time series 1 and 2 as one of the items appears in both series.

The solution found is:

a. Whenever possible, "one to one" correspondences are used (between HS2007, HS2002 and HS1996), like for series number: 1, 3, 4, 5,9, etc. (see Annex table)

b. When there are "one to many", "many to one" or "many to many" correspondences, items are grouped in the smallest group possible in order to form one "bloc of items time series" which would not create a break between 2006 and 2007. As an example: Series number 62 would consist in the sum of items HS 2002: 854221, 454229, 854260 and 854890 for years 2002 to 2006 and the sum of HS 2007: 854231, 854232, 854233 and 854239 for years 2007, 2008, 2009, etc. This way we would use Series nb. 62 (which is mainly made up of similar goods, for instance: " Electronic integrated circuits") as one of the 25 components of Group D- Electronic components. So it would be possible to observe which sub-parts of Group D are growing/declining in terms of exports/imports.

Figure 3 illustrates the creation of these 'bloc of items time series' called Series α, following the impossibility in having time series at the 6 digits level shown in Figure 2.

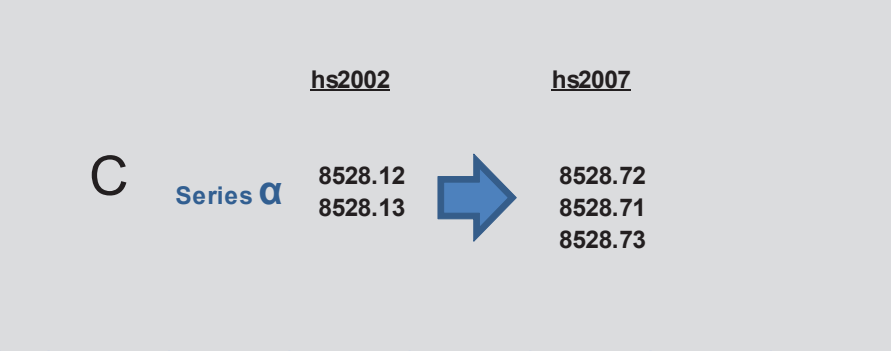
This led us to retain a total number of 72 time series for the ICT goods.

The goal was to make it possible to disaggregate the time series to the maximum composing one group. The advantages of being able to disaggregate are: first, the possibility to analyse the trade composition: which items are traded the most/the least. The second advantage is quality control, the more

disaggregated the easier it is to control their consistence through the different versions of classifications (HS1996, HS2002 and HS2007).

Figure 2. Illustration of a "many to many" correspondence from the HS 2002 to HS 2007 classifications

Figure 3. Creation of a "Bloc of items series" as a solution to "many to "many" correspondences



1.4.2. Provisional solution for United Kingdom fraud

Another major obstacle in obtaining coherent time series in ICT goods trade was the fact that United Kingdom ICT export data are fraught with errors. This is due to the United Kingdom VAT fraud (or carrousel fraud), which concerned false customs declaration of mobile phones (or similar goods) exports. The temporary solution found was to look for the excessive growth rates in United Kingdom's exports time series and to use estimates (based on mirror data) to correct the data. While this fraud influenced other European countries' data, it was not possible to clearly identify the scale of the collateral effects. We focused on the United Kingdom's exports. Looking at the United Kingdom's ICT goods exports showed

that the exports of the item 852520 increased of 250% in 2005 and 750% for 2006 in comparison to 2004, which was far from realistic. The use of mirror data (imports from the United Kingdom by the rest of world's countries of the same item) having shown that there was not such a dramatic jump in the United Kingdom's exports, the same moderate growth rate of mirror data was applied to estimate the correct exports data for the UK. These estimations only concern years 2005 and 2006 for the HS 2002 852520 item. The estimation results consist in reducing the declared export value of United Kingdom's mobile phones from USD 18 billion to USD 7 billion for 2005 and from USD 43 billion to USD 8 billion for 2006. The share of this item in United Kingdom's total ICT exports, goes from 33% to 12% for 2005 and from 50% to 9% for 2006. The same applies with total ICT exports for OECD countries for which the United Kingdom's mobile phone exports share is declining from 13% to 12% in 2005 and from 15% to 11% in 2006.

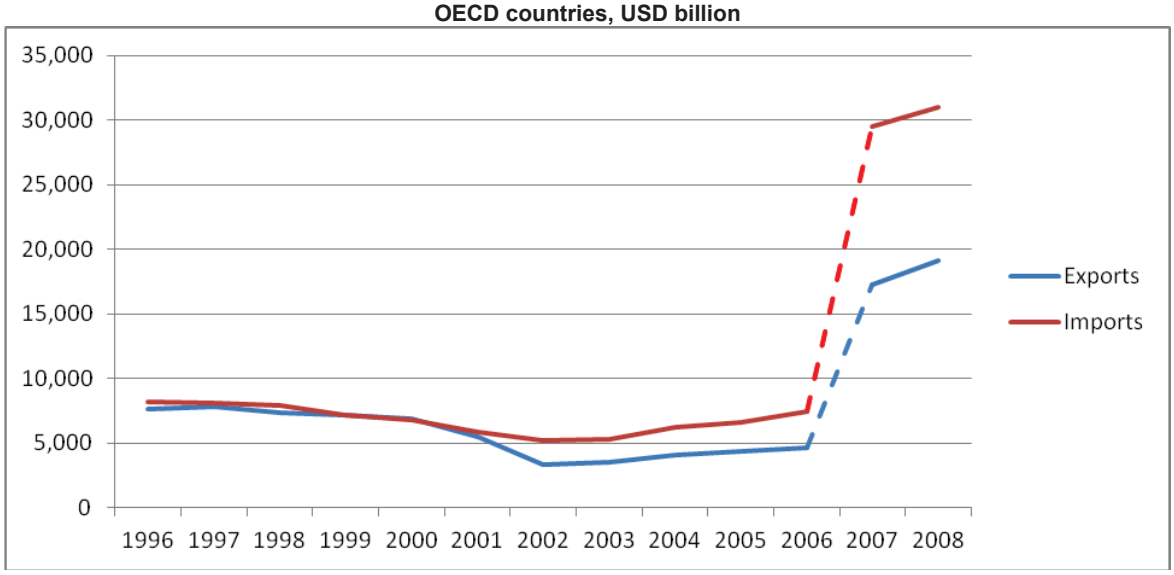
1.4.3. Problems with series including photocopy machines and printers

From the experts group's point of view this was the only time series which had a significant break from 2006 to 2007. Indeed in series 8 (see Annex table), the two items from the HS2007 classification that include photocopy machines and printers have a considerably higher value than all the items containing printers and photocopy machines in the former classification (Figure 4). One reason could be that new photocopiers are now integrated into computer networks, have a lot more functions, and can be legitimately integrated as ICT goods. As the value of this equipment is quite important, they create some discrepancy in the time series. No solution has yet been found regarding this issue.

1.4.4. The split of the Miscellaneous Group (D) of the 2008 definition in to two groups

The proposal to introduce an additional group to the 2008 ICT product definition was accepted by the WPIIS, where Electronic components and Miscellaneous belong to the same group. The split appears justified as Electronic components and Miscellaneous together would account for about 40% to 50% of the value of trade in ICT goods. Time series are now divided into five different groups: computers and peripheral equipment, communication equipment, consumer electronic equipment, electronic components and miscellaneous.

Figure 4. The photocopy machines and printers trade data, showing an important break in time series for OECD countries, USD billion



Note: The photocopy machines and printers time series includes for HS 2002: 844351 (Ink-jet printing machines), 851722 (Teleprinters), 851721 (Facsimile machines), 900911 (Electrostatic photocopying app. op. by repr. the original image directly onto the copy (direct process)) and 900912 (same as 900911 but for indirect process) and for HS 2007 : 844331 (Machines which perform two/more of the functions of printing, copying/facsimile transmission, capable of connecting to an automatic data processing machine/to a network) and 844332 (Other printers, copying machines & facsimile machines capable of connecting to an automatic data processing machine/to a network)

Source: Joint OECD-UNSD ITCS (International Trade by Commodity Statistics) database, February 2010.

2. Trends in ICT goods trade using the proposed correspondence

The second part of the paper has two distinctive goals, first to test the new correspondence table by being particularly attentive to unusual changes in trends for the last two years and secondly to analyse the trends in OECD member countries ICT trade.

The source of the data used is the OECD ITCS database in which the ICT definition and the six groups will soon be included. The work was conducted in co-operation with the Statistics Directorate (STD) to integrate the ICT group as a test for the time being[3]. We also used UN Comtrade data base for punctual data extractions.

When analysing the trends in ICT goods trade we kept in mind that trade is expressed in value (current prices) and that in the ICT sector, prices tend to decrease rapidly while the quality of traded goods tend to increase rapidly.[4] In this way the ICT goods trade differs a lot from the trade of raw material and other categories of goods.

3. The provisional ICT trade classification and correspondence table were first tested in the context of the OECD *Information Technology Outlook 2010* (ITO 2010), Chapter 2. At the time of publication the classification was not yet finalised, as a consequence the data published in the ITO 2010 are based on a slightly different selection of codes which does not affect the overall trends and conclusions of that chapter.

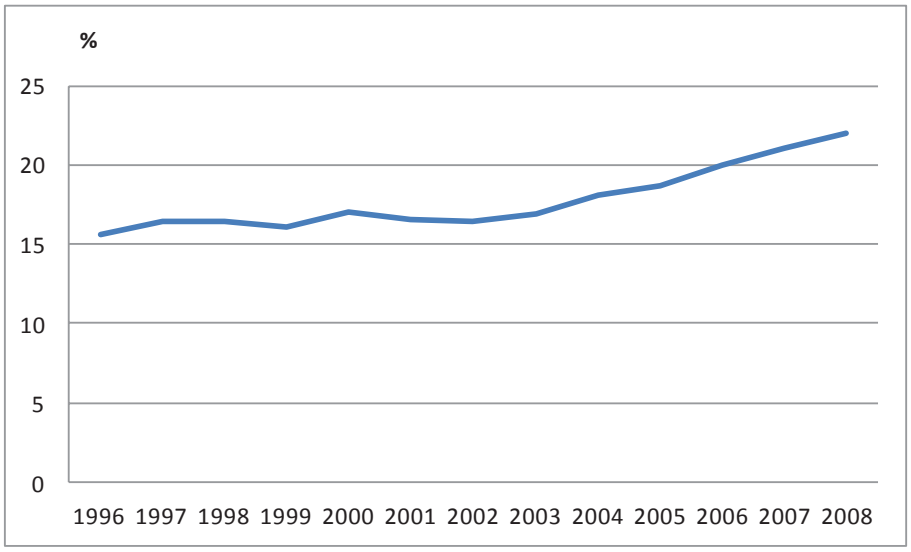
4. Ahmad, N., P. Schreyer and A. Wölfl (2004), "ICT Investment in OECD Countries and its Economic Impacts", The Economic Impact of ICT – Measurement, Evidence and Implications, OECD, Paris, pp. 61-83.

2.1. Global trends in ICT goods trade

The ICT goods trade of OECD countries was deeply affected by the burst of the Dot-com bubble I the 2000's leaving a very distinct shape to the exports and import curve: a very dynamic growth up to 2000, then a severe drop until 2003 followed by slow recovery until 2006 and another less pronounced slow down.

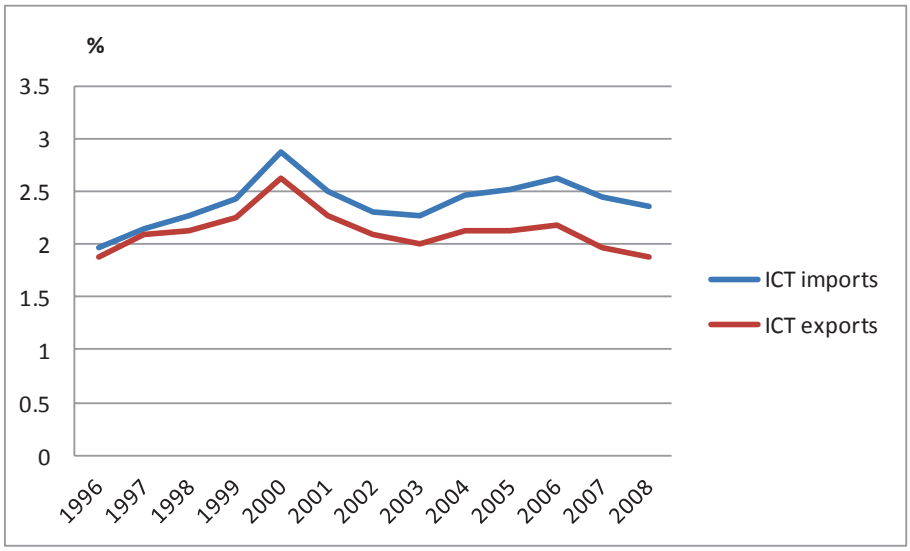
In terms of total goods trade, Figure 5 shows a constant growth of the ratio of total exports to GDP for OECD countries. For the last 12 years, export values went from 15.5% to nearly 22% of GDP of OECD member countries. In contrast, the ICT trade to GDP ratio for OECD countries follows the pattern mentioned above: a rapid growth until the year 2000 followed by a severe turn down until 2003 and then a slower growth, never really recovering the importance it had in the GDP, even with the recovery of 2006 (Figure 6).

Figure 5. Total Exports (all commodities) to GDP ratio for OECD countries



Source: Joint OECD-UNSD ITCS (International Trade by Commodity Statistics) database, February 2010.

Figure 6. ICT goods exports and imports to GDP ratio for OECD countries

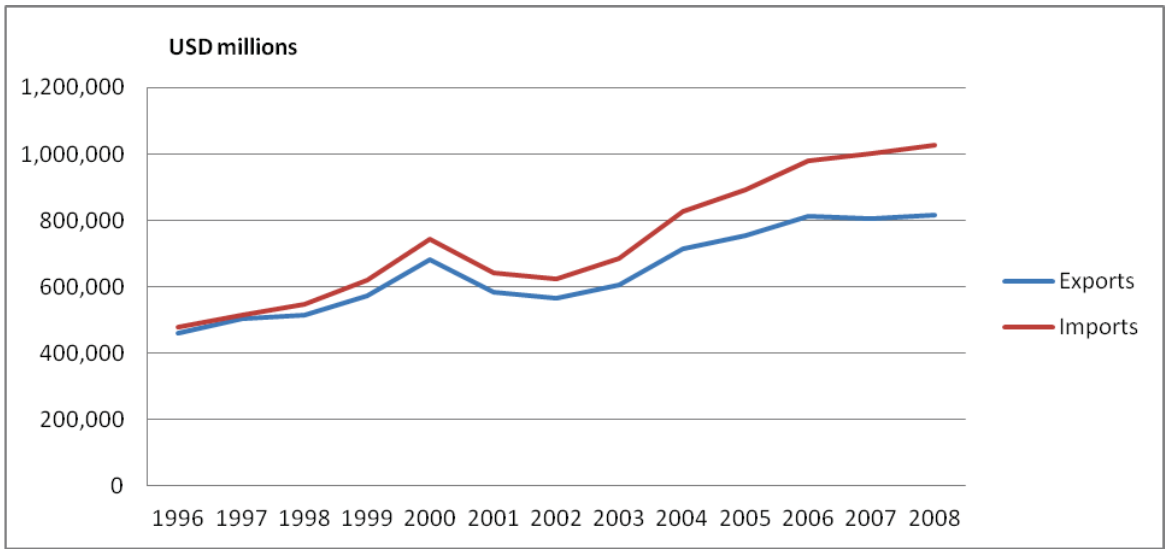


Source: Joint OECD-UNSD ITCS (International Trade by Commodity Statistics) database, February 2010.

Total trade of OECD countries with the world has grown steadily since 2002, after two years of slow-down following the burst of the Dot.com bubble. Another slow-down has been visible for the last two years, but it is difficult to be certain that the data are not biased by the effect of the statistical changes in HS classifications (Figure7).

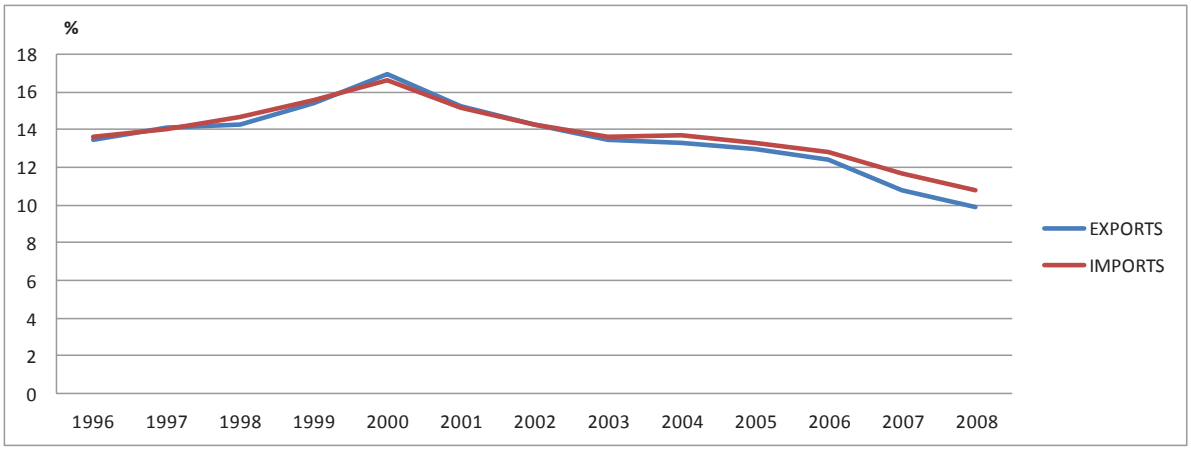
Nevertheless in relative terms, the ICT goods exports and imports are losing importance. In 2000, ICT goods trade represented nearly 17% of total exports, and it is now below 10% (Figure 8).

Figure 7. OECD countries total ICT trade (export and imports), USD billion



Source: Joint OECD-UNSD ITCS (International Trade by Commodity Statistics) database, February 2010.

Figure 8. Trade in ICT goods as a percentage of total trade for OECD countries

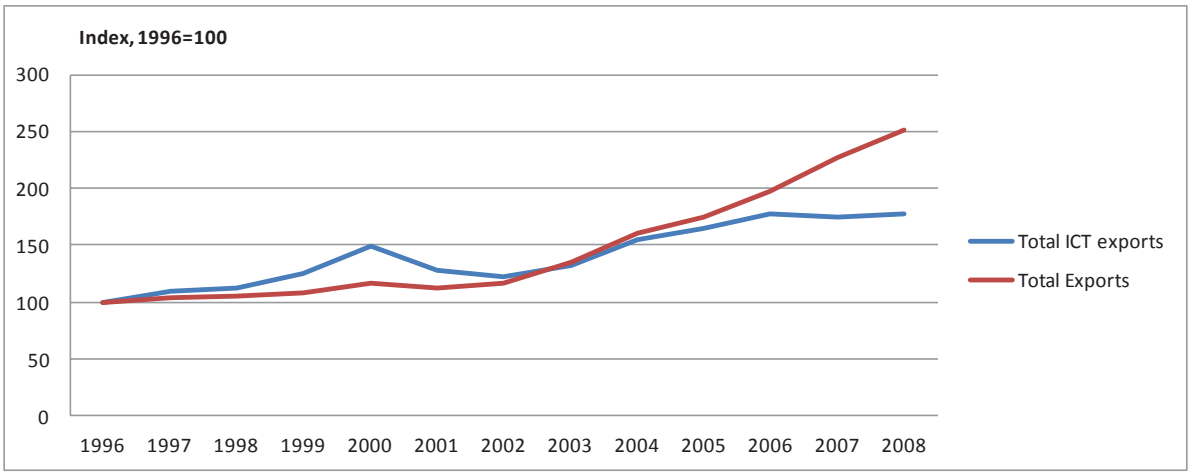


Source: Joint OECD-UNSD ITCS (International Trade by Commodity Statistics) database, February 2010.

Comparing the growth rate for ICT goods exports and total trade, the effect of the Dot.com bubble burst is striking. The high growth of the ICT goods exports was abruptly halted in year 2000, and then only four years later it had regained lost ground (Figure 9).

Other explanations for the decrease of ICT goods trade in relative terms might be that following the burst of the Dot.Com bubble, many IT investors switched sectors and turned their attention to raw material which led their prices to increase rapidly during this period, following an increased demand from the emerging countries in particular. Also because of the increase in oil prices from 2006, prices of all other commodities increased as well. As our data are based on values, this phenomenon emphasises the growth in overall trade.

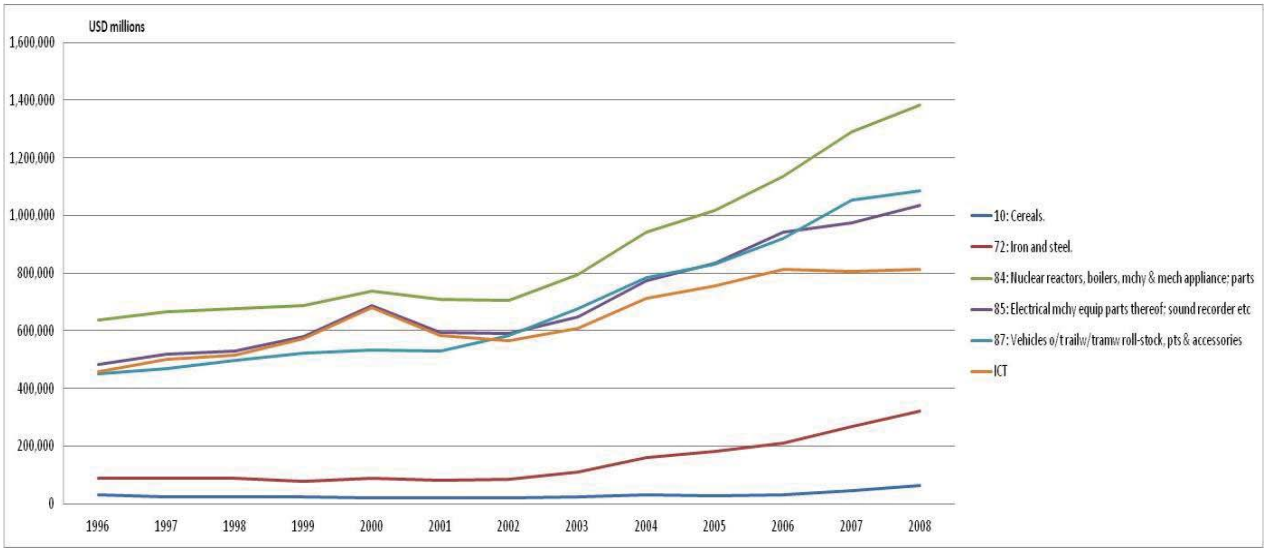
Figure 9. Exports in ICT goods and total exports (all commodities) growth for OECD countries (index, 1996=100)



Source: Joint OECD-UNSD ITCS (International Trade by Commodity Statistics) database, February 2010.

When compared to other sectors, the ICT goods broadly show similar trends, with the more severe downturn following year 2000 (Figure 10). It seems that after year 2002 many sectors' trade did grow more sharply.

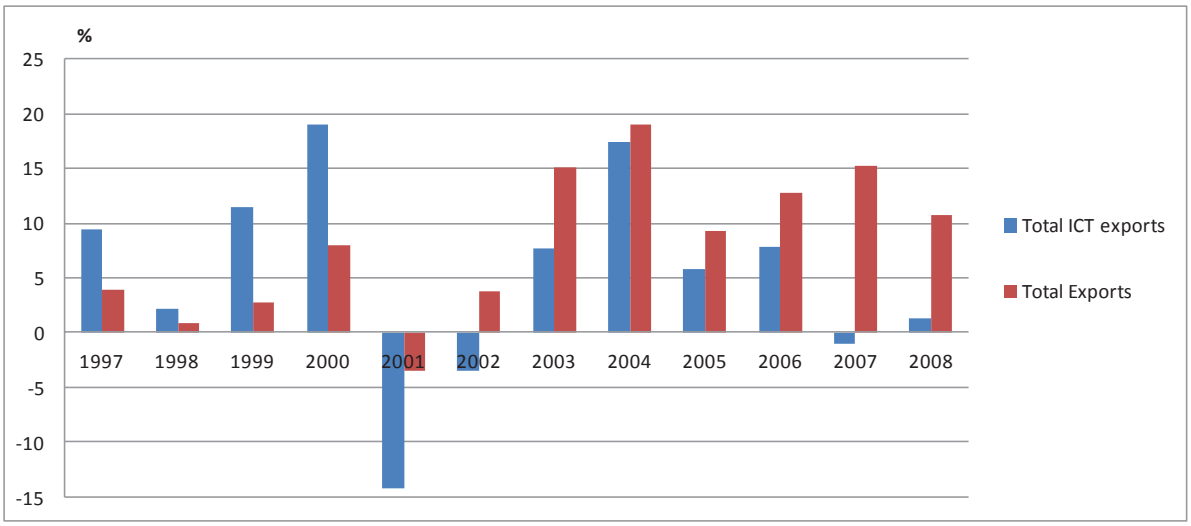
Figure 10. Exports of different categories of goods for OECD countries, USD millions



Source: Joint OECD-UNSD ITCS (International Trade by Commodity Statistics) database, February 2010.

The year-on-year growth rate of exports is another way to see this slowdown in ICT goods exports (Figure 11). The negative growth for total trade in 2001 did not reach the level of the ICT goods decrease and recovery was quicker, compared to ICT goods which always stayed behind.

Figure 11. Annual growth of ICT goods exports compare to total exports (all commodities) for OECD countries



Source: Joint OECD-UNSD ITCS (International Trade by Commodity Statistics) database, February 2010.

Figure 12 which concerns ICT goods trade between the major traders (the United States, China, EU15, Japan and Korea) illustrates the impressive growth of China. For the last 5 years, the growth of China exports in ICT goods to the United States was 147%, to EU15, 199% and to Japan and Korea together, 118%. It seems that China's exports did replace to some extent the trade occurring between the United States, EU15 and Japan and Korea; almost all the bilateral trade between these countries decreased in the last five years.

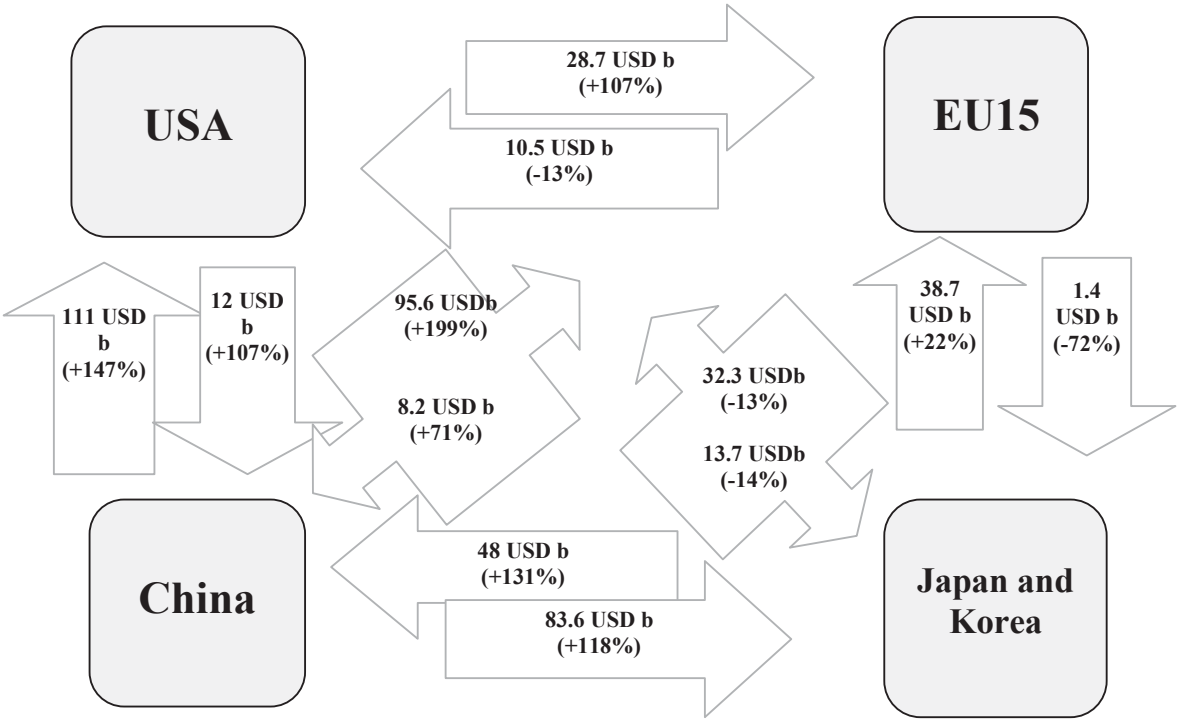
2.2. OECD countries' trade in ICT goods

In terms of the most important traders in ICT goods, the United States is still first in nominal terms, followed by Korea which switched places with Japan. In 2008, Japan had lower exports in ICT goods than in 2004 (Figure 13). This might be due to the strong competition from Korea and to the fact that Japan is off shoring more of its production to China and other Asian countries.

When looking at the imports, one country widely dominates the ICT goods, the United States with USD 261 billion of imports (Figure 14). The United States' imports grew by USD 41 billion in the last four years. It is more likely that most of the these imports are from China as over the last 5 years the United States' imports from China grew by USD 66 billion while imports from EU15, Japan and Korea decreased by around USD 7 billion (Figure 12). Germany, Japan and the Netherlands are the three other big importers of ICT goods in the OECD countries.

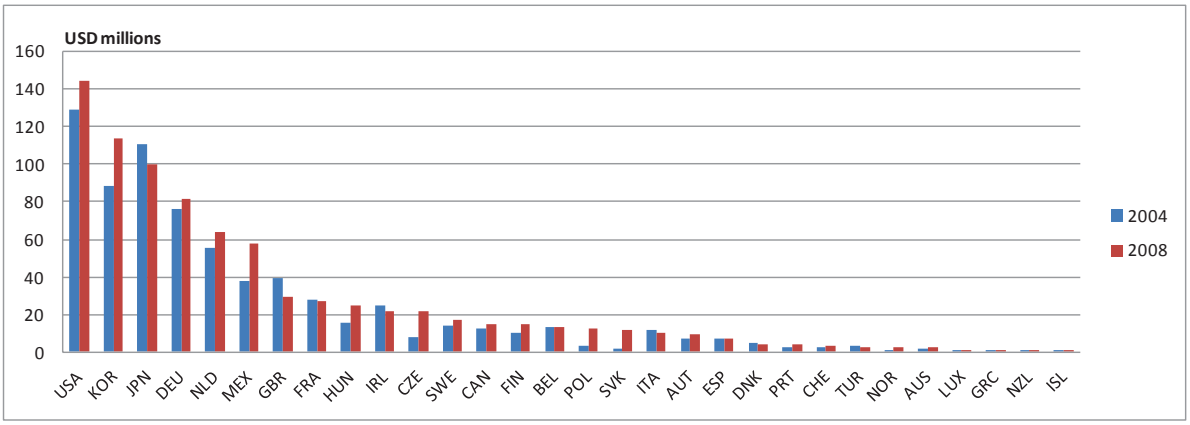
The revealed comparative advantages show that Korea, Hungary, Mexico and Ireland have the strongest comparative advantage in the ICT goods exports of OECD countries (Figure 15). These countries all invested a great deal of their resources in developing a dynamic ICT goods production industry.

Figure 12. Exports in ICT goods for selected major traders, in USD billion



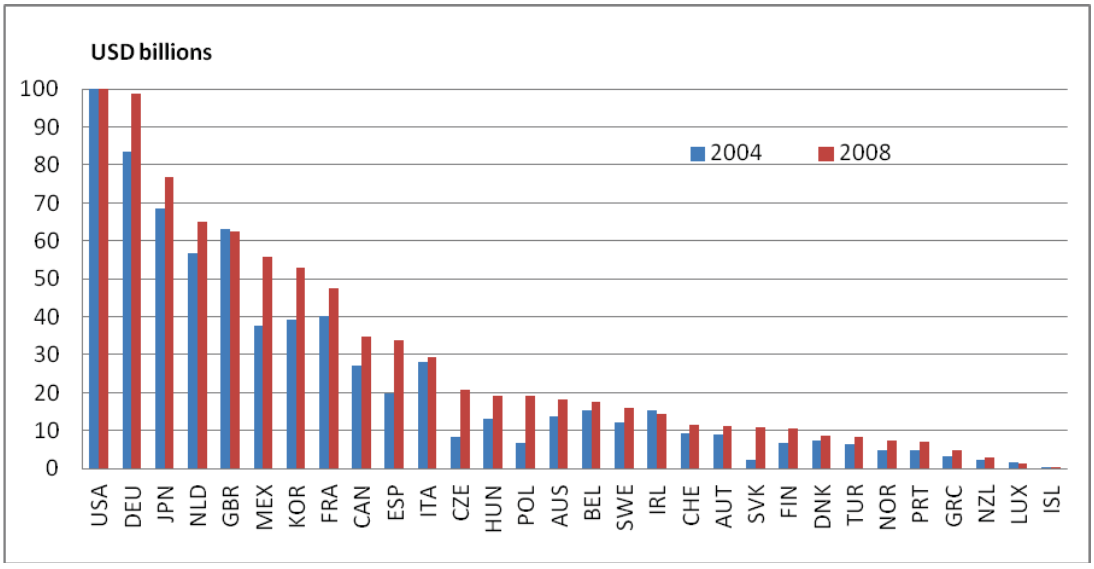
Note: The first number is the exports for 2008 in USD billion and the second number is the percentage of change in exports between 2003 and 2008. Trade data for China are not corrected for re-exports.
Source: Joint OECD-UNSD ITCS (International Trade by Commodity Statistics) database, February 2010.

Figure 13. ICT goods exports from OECD countries, by country, USD billion, 2004 and 2008



Source: Joint OECD-UNSD ITCS (International Trade by Commodity Statistics) database, February 2010.

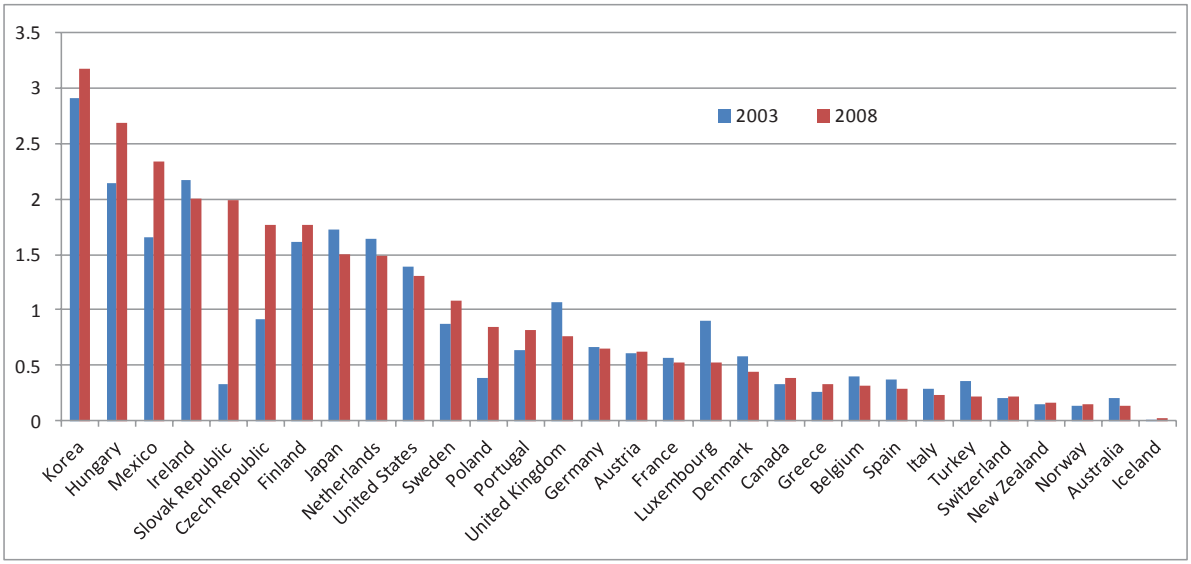
Figure 14. ICT goods imports from OECD countries, by country, USD billion, 2004 and 2008



Note: USA: 2004: 220 USD billion; 2008: 261 USD billion

Source: Joint OECD-UNSD ITCS (International Trade by Commodity Statistics) database, February 2010.

Figure 15. Revealed comparative advantage (RCA) in ICT goods, 2003-2008

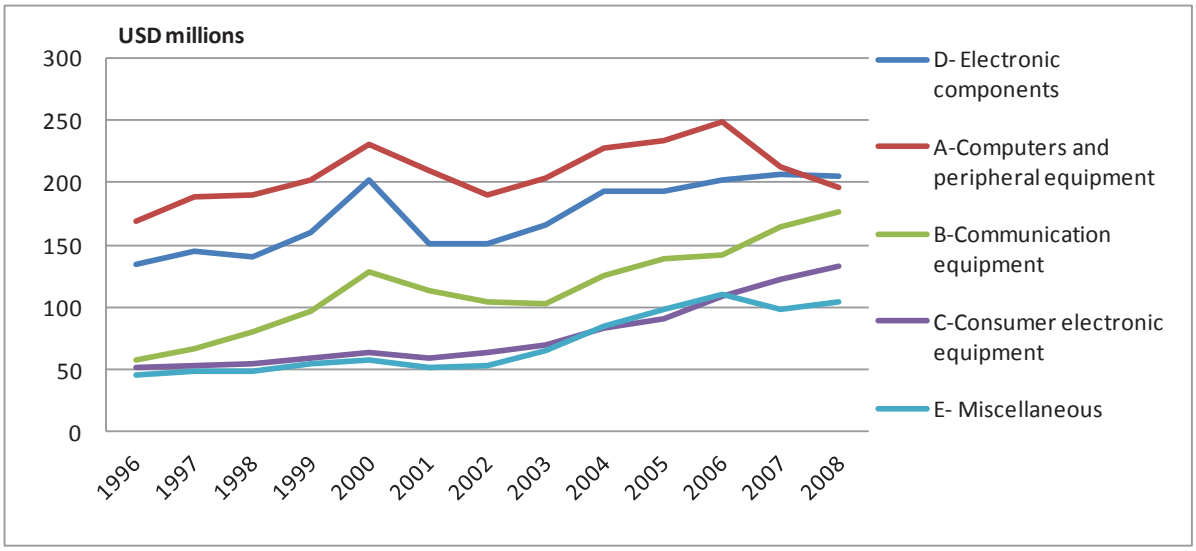


Source: Joint OECD-UNSD ITCS (International Trade by Commodity Statistics) database, February 2010.

2.3. Composition of ICT trade in goods

One interesting feature of the ICT goods definition is that it can be split into five main groups of a different nature which allows analysis of the composition of the ICT goods in more detail and to test more precisely the correspondence between classifications. The five groups are: A-Computers and peripheral equipment, B-Communication equipment, C-Consumer electronic equipment, D- Electronic components, E- Miscellaneous. Figure 16 shows the evolution of these groups which all follow similar trends with one notable difference for Group A which shows a sharp decrease after 2006. Is it due to the correspondence or to the nature of the components of this group? When looking at the details of the series by country one can notice that Series number 5, which mainly includes computer peripheral equipment is the one which has decreased the most, but for some countries only: Japan, the Netherlands, United Kingdom, Germany and France. It is more likely due to the fact that these goods face more and more competition from China rather than due to a problem with the correspondence. The four other groups do not show any break in time series.

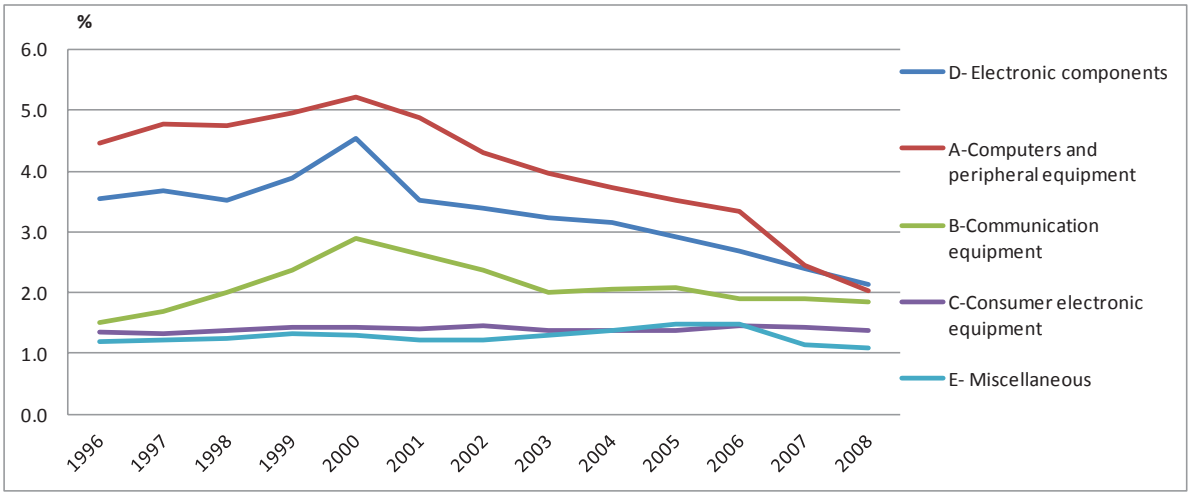
Figure 16. Exports ICT groups for OECD countries in USD millions



Source: Joint OECD-UNSD ITCS (International Trade by Commodity Statistics) database, February 2010.

The groups as a percentage of total Trade lose their relative importance, especially for Group A which is the main group in decline in ICT exports of the OECD countries (Figure 17).

Figure 17. Exports groups for OECD countries in % of total export

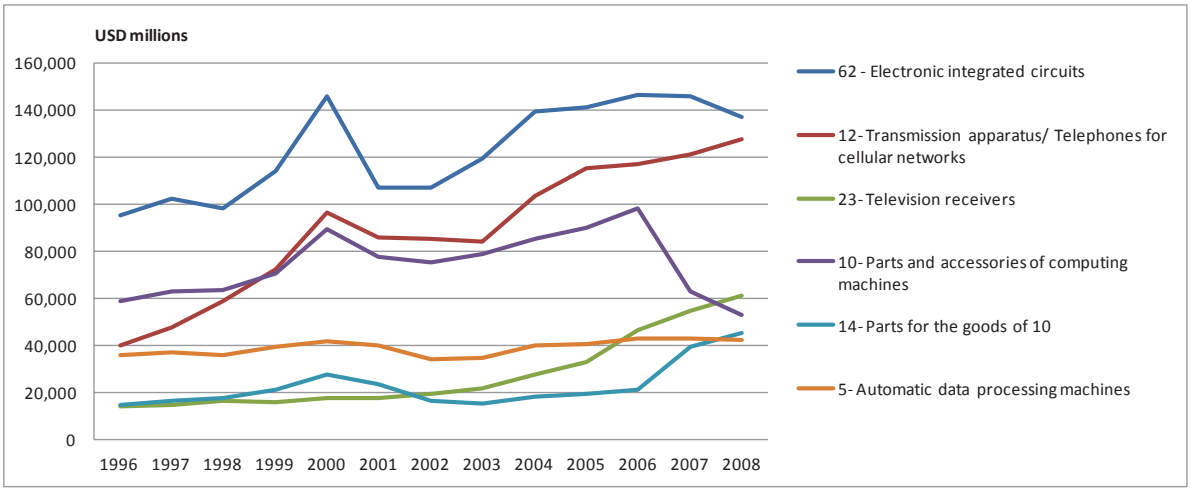


Source: Joint OECD-UNSD ITCS (International Trade by Commodity Statistics) database, February 2010.

A second level of disaggregation is the 72 time series composing the five groups seen previously. Figure 18 shows the seven most important time series of the ICT goods definition. These account for 62% of the values of ICT goods. One possibility given by the 'Blocs of items time series' is to allow the analysis of the internal dynamics of the different ICT goods groups. For instance, the most important time series: 62 Electronic integrated circuits and 12 Transmission apparatus/Telephones for cellular networks. Series 62 is made up of electronic components, so it is quite natural that it fluctuates following the world's economic demand but remains one of the most important elements of the ICT goods production. The

second most important series is number 12 including mobile phone handsets. This is the fastest growing series. One interesting feature is that series 12 which is composed of consumers' goods is closely followed, at the 5th place, by series 142 which is partly composed of goods of series 120. Both of these series are major traders of ICT goods. A closer study of the changes in directions of the trade of these series would be quite interesting.

Figure 18. The most important traded goods for OECD countries



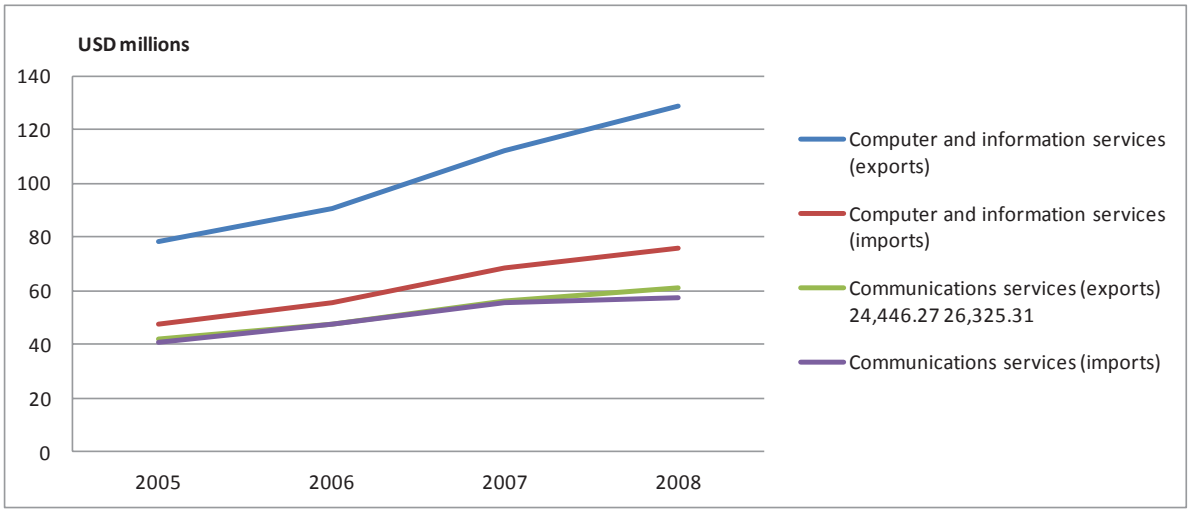
Source: Joint OECD-UNSD ITCS (International Trade by Commodity Statistics) database, February 2010.

2.4. Trade in ICT services

Trade in ICT services is also available for two different indicators: Communication services and Computer and information services. Trade in ICT services is developing very quickly with 58% of growth n the last three years (Figure 19) and is still one of the greatest comparative advantages of the OECD countries in the ICT sector. The reason why this paper does not analyse these data more in depth is that trade in services statistics are in the Extended Balance of Payments Services (EBOPS) classification. Ireland, United States, United Kingdom and Germany dominate the trade in ICT services (Figures 20 and 21). According to our data, Ireland is the most important exporter and United States the most important importer. Ireland is indeed a country where many IT companies set up their European headquarters, making this country the leader in ICT services.

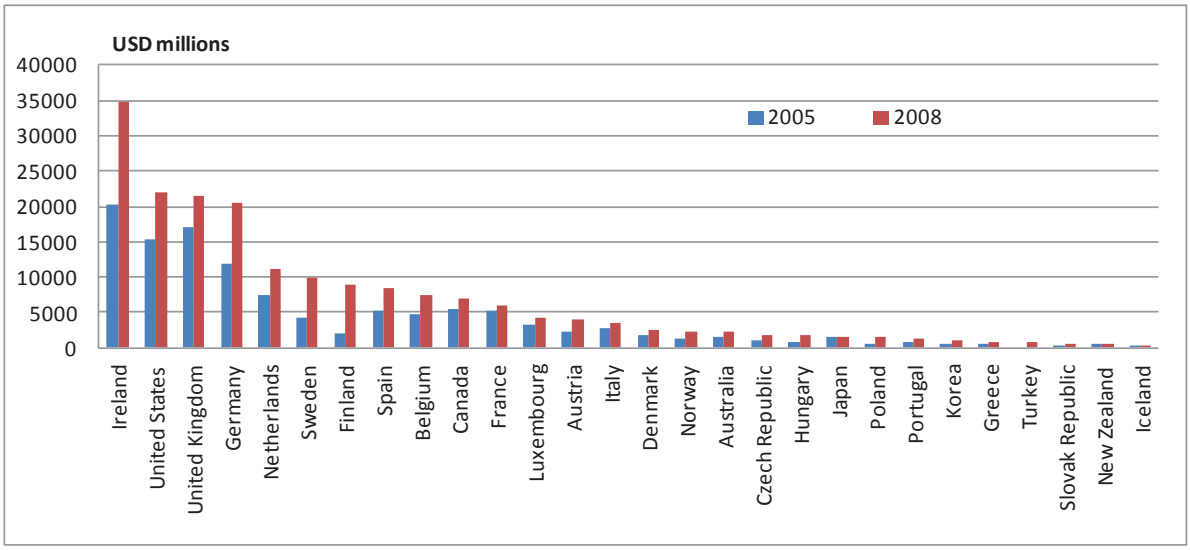
It is very interesting to observe the opposite trend for the Royalties and license fees services data, as Ireland appears to be one of the most important importers. This shows that Ireland is a major European platform for mainly American ICT companies. Unfortunately, the Royalties and license fees data cannot be broken down to the Software license level for the moment. The new EBOPS (based on BPM6) classification does have the software license category, but European countries will not make these data available in the new classification before 2014.

Figure 19. Trade in services for OECD countries



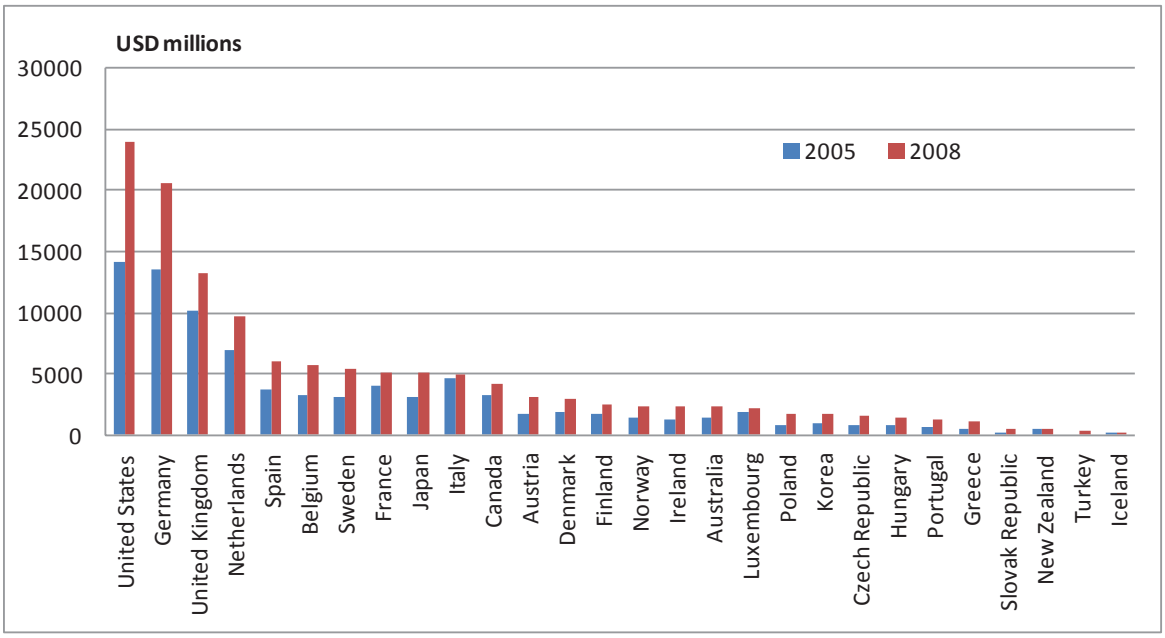
Source: OECD Trade in Services by Category of Service database

Figure 20. ICT services exports by countries.



Source: OECD Trade in Services by Category of Service database

Figure 21. ICT services imports by countries.



Source: OECD Trade in Services by Category of Service database

In the near future, trade in ICT services might have major changes that will strongly impact the trade in ICT goods statistics. Indeed, in the forthcoming revision of International Monetary Fund (IMF) Balance of payments statistics guidelines (Bpm6), the 'Goods for processing' will be classified in the services and no longer in the goods trade. For major traders like China, it will shift a considerable amount of their ICT trade into services, as this country is known for processing labour intensive segments of the production of goods, ICT goods being the fastest growing part of the goods for processing' business.

Conclusions

This paper illustrates how changes in the HS classifications have an impact on current measurement of ICT goods trade and presents how WPIIS proposes to tackle the problem. ICT goods items have been grouped following the new 2008 ICT definition. The new list groups together sub-items with a different level of disaggregation, sometimes one 6-digit items constituting one time series, sometimes the sum of many 6-digit items constituting one single time series.

The list was first designed using the correlation tables provided by the World Customs Organization (WCO). In a second time, the list was 'adapted' to future analyst's needs by regrouping items that could not be separated without causing a break in time series. The main changes brought by these modifications are listed in paragraph 1.4.

The second part of the paper showed that trade trends analysis was possible using the new definition and the correspondence table.

The consistence of time series from 2006 and 2007 was carefully checked. Some series showed a clear time break, the most apparent being Series 8 "Photocopy machines and printers" (see paragraph 1.4.3). The reasons for the observed break in time series were also investigated in order to make sure that they were not due to a sudden change in trade flows in a few countries.

After a round of consultations, an agreement on a common correspondence table and a common way to disaggregate the ICT goods groups was reached.

It was agreed:

a. To use the 2008 definition of ICT products (Guide to Measuring the Information society 2009 and the forthcoming Guide to Measuring the Information society 2011) to analyse ICT goods trade for the period 1996-2008 and to no longer use the old 2003 definition;

b. To use the chosen HS 2007 and HS 2002 items lists to fit the CPC rev. 2 definition. The main change was to include the item 'Video game consoles' [950410] to the HS 2007 list;

c. To use the 'bloc of items time series' concept as a solution to bridge the HS 2007 and HS 2002 classifications;

d. To split the former Group D - Miscellaneous into two groups: D - Electronic components and E- Miscellaneous;

e. To provide an estimate of the value of "old" ICT goods over 1996-2008 as a means to reconcile the time series based on the old and the new definitions.

ANNEX TABLE: CORRESPONDENCE TABLE BETWEEN THE CPC REV. 2, HS 2007, HS 2002 AND HS 1996 CLASSIFICATIONS FOR ICT GOODS.

CPC rev 2	Time series [items/blocs] numbers	HS 2007		HS 2002	HS 1996
A-Computers and peripheral equipment					
45142 Point-of-sale terminals, ATMs and similar machines capable of being connected to a data processing machine or network	1	847050	Cash registers	847050	847050
	2	847290	Other office machines (eg. hectograph/stencil duplicating machines, addressing machines, automatic banknote dispensers, coin-sorting machines, coin-counting/wrapping machines, pencil-sharpening machines, perforating/stapling machines), exclud. 8472.10 & 8	847290	847290
				847220	847220
45221 Portable automatic data processing machines weighing not more than 10 kg 45222 Personal digital assistants and similar computers such as laptop and notebook computers	3	847130	Portable automatic data processing machines, weighing not more than 10 kg, consisting of a least a central processing unit, a keyboard & a display	847130	847130
45230 Automatic data processing machines, comprising in the same housing at least a central processing unit and an input and output unit, whether or not combined	4	847141	Other automatic data processing machines : Comprising in the same housing at least a central processing unit & an input & output unit, whether/not combined	847141	847141
45240 Automatic data processing machines presented in the form of systems	5	847149	Other automatic data processing machines , presented in the form of systems.	847149	847149
45250 Other automatic data processing machines whether or not containing in the same housing one or two of the following types of units: storage units, input units, output units	6	847150	Processing units other than those of sub-heading 8471.41/8471.49, whether/not containing in the same housing one/two of the following types of unit : storage units,	847110 847150	847110 847150
45261 Input peripherals (keyboard, joystick, mouse etc.)	7	847160	Input/output units, whether/not containing storage units in the same housing	847160	847160
45262 Scanners (except combination of printer, scanner, copier and/or fax)		847180	Other units of automatic data processing machines, exclud. 8471.50, 8471.60, 8471.70.	847180	847180
45289 Other units of automatic data processing machines		847190	Magnetic/optical readers, machines for transcribing data onto data media in coded form	847190	847190
45269 Other input or output peripheral devices		852841	Cathode-ray tube monitors , of a kind solely/principally used in an automatic data		
47315 Monitors and projectors principally used in an automatic data processing system		852851	Other monitors, of a kind solely/principally used in an automatic data processing system		
		852861	Projectors, Of a kind solely/principally used in an automatic data processing system of		
45263 Inkjet printers used with data processing machines	8	844331	Machines which perform two/more of the functions of printing, copying/facsimile transmission, capable of connecting to an automatic data processing machine/to a	844351	844351
45264 Laser printers used with data processing machines		844332	Other printers, copying machines & facsimile machines, whether/not combined , exclud	851722	851722
45265 Other printers used with data processing machines			the ones which perform two/more of the functions of printing, copying/facsimile	851721	851721
45266 Units performing two or more of the following functions: printing, scanning, copying, faxing			transmission; capable of connecting to an automatic data processing machine/to a network	900911 900912	900911 900912
45271 Fixed media storage units 45272 Removable media storage units 47550 Solid-state non-volatile storage devices (*)	9	847170	Storage units	847170	847170
45290 Parts and accessories of computing machines	10	847330	Parts & accessories of the machines of heading 84.71	847330	847330
		847350	Parts & accessories equally suitable for use with machines of two/more of the headings 84.69 to 84.72	847350	847350

CPC rev 2		HS 2007		HS 2002	HS 1996
B-Communication equipment					
46921 Burglar or fire alarms and similar apparatus	11	853110	Burglar/fire alarms & similar apparatus	853110	853110
47211 Transmission apparatus incorporating reception apparatus		852560	Transmission apparatus for radio-broadcasting/televison incorporating reception apparatus	852520	852520
47212 Transmission apparatus not incorporating reception apparatus		852550	Transmission apparatus for radio-broadcasting/television	852510	852510
47222 Telephones for cellular networks or for other wireless networks		851712	Telephones for cellular networks/for other wireless networks, other than Line telephone sets with cordless handsets	851750	851750
47223 Other telephone sets and apparatus for transmission or reception of voice, images or other data, including apparatus for communication in a wired or wireless network (such as a local or wide area network)		851761	Base stations for transmission/reception of voice, images/other data, incl. apparatus for communication in a wired/wireless network (such as a local/wide area network)	851730	851730
	12	851762	Machines for the reception, conversion & transmission/regeneration of voice, images/other data, incl. switching & routing apparatus		
		851718	Other telephone sets, incl. telephones for cellular networks/for other wireless networks, other than 8517.11 & 8517.12	851719	851719
		851769	Other apparatus for transmission/reception of voice, images/other data, incl. apparatus for communication in a wired/wireless network (such as a local/wide area network) , other than 8517.61 & 8517.62	851780 852790	851780 852790
47221 Line telephone sets with cordless handsets	13	851711	Line telephone sets with cordless handsets	851711	851711
47401 Parts for the goods of subclass 47221 to 47223		851770	Parts of telephone sets, incl. telephones for cellular networks/for other wireless networks; other apparatus for the transmission/reception of voice, images/other data,	851790	851790
	14		incl. apparatus for communication in a wired/wireless network (such as a local/wide ar		
47213 Television cameras (**)					
C-Consumer electronic equipment					
47311 Radio broadcast receivers (except of a kind used in motor vehicles) whether or not combined with sound recording or reproducing apparatus or a clock	15	852712	Pocket-size radio cassette-players	852712	852712
	16	852713	Radio-broadcast receivers capable of operating without an external source of power, combined with sound recording/repr. apparatus (excl. of 8527.12)	852713	852713
	17	852719	Radio-broadcast receivers capable of operating without an external source of power (excl. of 8527.12 & 8527.13)	852719	852719
	18	852791	Other reception apparatus for radio-broadcasting, combined with sound recording/reproducing apparatus.	852731	852731
	19	852792	Other reception apparatus for radio-broadcasting, not combined with sound recording/reproducing apparatus but combined with a clock.	852732	852732
	20	852799	Other reception apparatus for radio-broadcasting, excl. 8527.91 & 8527.92	852739	852739
47312 Radio broadcast receivers not capable of operating without an external source of power, of a kind used in motor vehicles	21	852721	Radio-broadcast receivers not capable of operating without an external source of power, of a kind used in motor vehicles...combined with sound recording/reproducing apparatus	852721	852721
	22	852729	Radio-broadcast receivers not capable of operatingwithout an externalsource of power,of a kind used in motor vehicles,incl.apparatuscapable of receiving also radio-telephony/radio-telegraphy,other(excl.of 8527.21)	852729	852729
47313 Television receivers, whether or not combined with radio-broadcast receivers or sound or video recording or reproducing apparatus		852871	Reception apparatus for televison, Not designed to incorporate a video display/screen	852812	852812
	23	852872	Other colour reception apparatus for television, whether/not incorporating radio-broadcast receivers/sound/video recording/reproducing apparatus,	852813	852813
		852873	Other reception apparatus for television, whether/not incorporating radio-broadcast receivers/sound/video recording/reproducing apparatus, black & white/other monochrome.		

CPC rev 2		HS 2007		HS 2002	HS 1996
C-Consumer electronic equipment (*continued*)					
47314 Monitors and projectors, not incorporating television reception apparatus and not principally used in an automatic data processing system	24	852849	Other cathode-ray tube monitors , not of a kind solely/principally used in an automatic data processing system of heading 84.71	852821	852821
		852859	Other monitors, not of a kind solely/principally used in an automatic data processing system of heading 84.71	852822	852822
	25	852869	Projectors, not of a kind solely/principally used in an automatic data processing system of heading 84.71	852830	852830
47321 Sound recording or reproducing apparatus	26	851930	Turntables (record-decks)	851931 851939	851931 851939
	27	851950	Telephone answ ering machines	852020	852020
	28	851981	Other sound recording/reproducing apparatus, using magnetic, optical/semiconductor media, other than 8519.20, 8519.30, 8519.50	851940	851940
		851989	Other sound recording/reproducing apparatus, other n.e.s. in Ch. 85.19	851992 851993 851999 852010 852032 852033 852039 852090 851921 851929	851992 851993 851999 852010 852032 852033 852039 852090 851921 851929
	29	851920	Apparatus operated by coins, banknotes, bank cards, tokens/by other means of	851910	851910
47323 Video recording or reproducing apparatus	30	852110	Video recording/repr. apparatus, w hether/not incorporating a video tuner, magnetic tape-type	852110	852110
	31	852190	Video recording/repr. apparatus other than magnetic tape-type, w hether/not incorporating a video tuner	852190	852190
47330 Microphones and stands therefor; loudspeakers; headphones, earphones and combined microphone/speaker sets; audio-frequency electric amplifiers; electric sound amplifier sets	32	851810	Microphones & stands therefor	851810	851810
	33	851821	Single loudspeakers, mounted in their enclosures	851821	851821
	34	851822	Multiple loudspeakers, mounted in the same enclosure	851822	851822
	35	851829	Loudspeakers n.e.s. in 85.18, w hether/not mounted in their enclosures	851829	851829
	36	851830	Headphones & earphones, w hether/not combined w ith a microphone, & sets consisting of a microphone & one/more loudspeakers	851830	851830
	37	851840	Audio-frequency electric amplifiers	851840	851840
	38	851850	Electric sound amplifier sets	851850	851850
47402 Parts for the goods of subclasses 47321, 47323 and 47330	39	851890	Parts of the apparatus & equip. of 85.18	851890	851890
	40	852210	Pick-up cartridges for use solely/principally w ith the apparatus of 85.19-85.21	852210	852210
	41	852290	Parts (excl. pick-up cartridges) & accessories suit. for use solely/principally w ith the apparatus of 85.19-85.21	852290	852290
38581 Video game consoles (2)	42	950410	Video games of a kind used w ith a television receiver	950410	950410
47214 Video camera recorders 47215 Digital cameras	43	852580	Television cameras, digital cameras & video camera recorders	852530 852540	852530 852540

CPC rev 2		HS 2007		HS 2002	HS 1996
D- Electronic components					
47140 Thermionic, cold cathode or photo-cathode valves and tubes (including cathode ray tubes)	44	854011	Cathode-ray television picture tubes, incl. video monitor cathode-ray tubes, colour	854011	854011
	45	854012	Cathode-ray television picture tubes, incl. video monitor cathode-ray tubes, black & white/other monochrome	854012	854012
	46	854020	Television camera tubes; image converters & intensifiers; other photo-cathode tubes	854020	854020
	47	854040	Data/graphic display tubes, colour, with a phosphor dot screen pitch smaller than 0.4mm	854040	854040
	48	854050	Data/graphic display tubes, black & white/other monochrome	854050	854050
	49	854060	Cathode-ray tubes n.e.s. in 85.40	854060	854060
	50	854071	Magnetrons	854071	854071
	51	854072	Klystrons	854072	854072
	52	854079	Microwave tubes n.e.s. in 85.40	854079	854079
	53	854081	Receiver/amplifier valves & tubes	854081	854081
	54	854089	Valves & tubes n.e.s. in 85.40	854089	854089
47150 Diodes, transistors and similar semi-conductor devices; photosensitive semi-conductor devices; light emitting diodes; mounted piezo-electric crystals	55	854110	Diodes (excl. photosensitive/light emitting diodes)	854110	854110
	56	854121	Transistors (excl. photosensitive transistors), with a dissipation rate of <1W	854121	854121
	57	854129	Transistors (excl. photosensitive transistors), other than those with a dissipation rate of <1W	854129	854129
	58	854130	Thyristors, diacs & triacs (excl. photosensitive devices)	854130	854130
	59	854140	Photosensitive semiconductor devices, incl. photovoltaic cells whether/not assembled in modules/made up into panels; light emitting diodes	854140	854140
	60	854150	Semiconductor devices n.e.s. in 85.41	854150	854150
	61	854160	Mounted piezo-electric crystals	854160	854160
47160 Electronic integrated circuits	62	854231	Electronic integrated circuits, processors & controllers, whether/not combined with memories, converters, logic circuits, amplifiers, clock & timing circuits,/other circuits	854221	854213
		854232	Electronic integrated circuits, memories	854229	854230
		854233	Electronic integrated circuits, qmplifiers	854260	854240
		854239	Other Electronic integrated circuits, other than Amplifiers/Memories/Processors & controllers	854890	854890
					854214
					854219
47173 Parts for the goods of subclasses 47140 to 47160	63	854091	Parts of cathode-ray tubes	854091	854091
	64	854099	Parts of the tubes of 85.40 other than cathode-ray tubes	854099	854099
	65	854190	Parts of the devices of 85.41	854190	854190
47920 "Smart cards"	66	854290	Parts of electronic integrated circuits	854290	854290
		852352	Semi-conductor media, "Smart cards" for the recording of sound/of other phenomena, but excl. products of Ch. 37.	854210	854212
47910 Cards with a magnetic stripe	67	852321	Magnetic media for the recording of sound/of other phenomena, but excl. products of Ch. 37., cards incorporating a magnetic stripe	852330	852330
				852460	852460
47130 Printed circuits	68	853400	Printed circuits	853400	853400

CPC rev 2		HS 2007		HS 2002	HS 1996
E- Miscellaneous					
45281 Sound, video, netw ork and similar cards for automatic data processing machines (***)					
47530 Magnetic media, not recorded, except cards w ith a magnetic stripe		852351	Semi-conductor media, solid-state non-volatile storage devices, for the recording of sound/of other phenomena, but excl. products of Ch. 37.	852390 852410	852390 852410
47540 Optical media not recorded		852359	Other semi-conductor media, for the recording of sound/of other phenomena, but excl. products of Ch. 37., other than "Smart Cards" & Solid-state non-volatile storage devices	852491	852491
47590 Other recording media, including matrices and masters for the production of disks		852380	Discs, tapes, solid-state non-volatile storage devices, "smart cards" & other media for the recording of sound/of other phenomena, w hether/not recorded, incl. matrices & masters for the production of discs, but excl. products of Ch.37., other n.e.s.	852499	852499
47403 Parts for the goods of subclasses 47211 to 47213, 47311 to 47315 and 48220				854381	854381
48315 Liquid crystal devices n.e.c.; lasers except laser diodes; other optical appliances and instruments	70	852910	Aerials & aerial reflectors of all kinds suit. for use solely/principally w ith the apparatus of 85.25-85.28; parts suit. for use therew ith	852910	852910
	71	852990	Other parts suitable for use solely/principally w ith the apparatus of headings 85.25 to	852990	852990
48354 Parts and accessories for the goods of subclass 48315	72	901320	Lasers (excl. laser diodes)	901320	901320

Notes:

1. The ICT product definition was first published in the OECD Guide to measuring the information society 2009, available online [www.oecd.org/sti/measuring-infoeconomy/guide]. The list of ICT goods (in CPC rev.2 and HS2007) was also published (as provisional) in the Partnership on Measuring ICT for Development (2010) Core ICT Indicators 2010, Geneva (ITU) [http://www.itu.int/ITU-

2. HS 2007: 950410 "Video games of a kind used with a television receiver" was added to this list in order to correspond to the CPC rev. 2 : 38581 "Video game consoles" which is included in the latest ICT Products

Three CPC rev. 2 items (codes) in this list do not have their HS2007 corresponding items in the same group. Their HS 2007 corresponding item was classified in another group in order to keep the consistence of the HS 2007 to HS 2002 correspondence's logic.

(*) CPC rev. 2: 47550 corresponding item HS2007: 852351 is classified in Group E.
(**) Group B CPC rev. 2: 47213 corresponding item HS2007: 852580 is classified in Group C.
(***) Group E CPC rev. 2: 45281 corresponding items HS2007: 847180 and 851769 are classified in Groups A and B.