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OECD BILATERAL TRADE DATABASE BY INDUSTRY AND END-USE CATEGORY

(BTDIXE)

BASE DE DONNÉES DE L'OCDE SUR LES ÉCHANGES BILATÉRAUX PAR INDUSTRIE ET CATÉGORIE D'UTILISATION FINALE

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1. INTRODUCTION

The OECD STAN Bilateral Trade Database (BTD) *by industry* was updated on a regular basis until 2010. However, in the immediate aftermath of the financial crisis, when there was a simultaneous collapse in international trade across the globe, it became clear that new metrics were required to better understand modern trading patterns. In particular, the increasing depth and breadth of international fragmentation of production and the proliferation of Global Value Chains (GVCs), meant that a better understanding of the role of trade in intermediate or 'semi-manufactured' goods became essential for framing trade policies. To address this issue, BTD was re-developed with the aim of providing estimates of bilateral trade in goods not only by industry but also by end-use category.

The OECD **STAN Bilateral Trade by Industry and End-use** (BTDIxE) was first released at the end of 2011 (Zhu, Yamano and Cimper, 2011) in order to highlight international flows of intermediate goods. It proved to be an efficient tool widely used by many trade analysts. The database is used, together with national Supply-Use and Input-Output tables, as an input into the OECD's Inter-Country Input-Output (ICIO) system – the principle source of the Trade in Value Added (TiVA) indicators developed by OECD and WTO[1].

BTDIxE[2] consists of estimates of imports and exports of goods, broken down by reporting and partner countries, and by both industrial activities and end-use categories. Estimates are expressed in nominal terms, in current US dollars and are presented in the form of time-series for more than a hundred reporters and partners, including all 34 OECD member countries, a wide range of non-OECD economies, as well as the partners *Total World*, *Unspecified* and *Rest of the World*. The trade flows are divided into nine categories of goods, including the three main end-uses *capital goods*, *intermediate inputs* and *consumption*, and broken down by economic activities based upon the Revisions 3 and 4 of the ISIC classification .

[1] www.oecd.org/trade/valueadded

[2] www.oecd.org/sti/btd

BTDIxE versions

Editions	Country	Industry	End-use	Time-period	Status
From 2014	154 reporters 159 partners	71 ISIC Rev.4 based activities incl. industry aggregates	9 categories	1990-latest available year	Ongoing
2014- 2016	154 reporters 159 partners	66 ISIC Rev.3 based activities incl. industry aggregates	9 categories	1990-2014/15	Archived
2013	152 reporters (2012 coverage + additional non-OECD economies - see Table 1) 156 partners	66 ISIC Rev.3 & Rev.4 based activities incl. aggregates	9 categories	1990-2012/13	Discontinued
2012	66 reporters (OECD + BRIICS, major Asian, G20, CEFTA economies), 70 partners.	59 ISIC Rev.3 based activities incl. aggregates	9 categories	1990-2011	Archived, used in ICIO 2012
2011	66 reporters (OECD + BRIICS, major Asian, G20, CEFTA economies), 70 partners	59 ISIC Rev.3 based activities incl. aggregates	9 categories	1995-2010	Archived
2010	35 reporters (OECD + Chinese Taipei), 72 partners	43 ISIC Rev.3 based activities incl. aggregates	*not available*	1988-2010	Archived

2. UNDERLYING SOURCES AND COVERAGE

2.1 Data sources

Bilateral Trade in goods by Industry and End-Use (BTDIxE) is derived from the OECD's International Trade by Commodities Statistics (ITCS[1]) and the UNSD's Comtrade[2], where annual values and quantities of imports and exports are compiled by partner country and according to product classifications. From the mid-2000s the OECD and UNSD worked closely on the convergence of ITCS and Comtrade updating processes to facilitate data sharing and to ensure consistency across the two databases. In mid-2012, the two international organisations agreed to centralise the data collection and processing procedures within UNSD. While OECD provides additional quality assurance, the latest data in ITCS should be completely synchronised with UNSD Comtrade.

In Comtrade and ITCS, data are classified by reporting (or declaring) country (*i.e.* the country supplying the information), by partner country (*i.e.* the origin of imports and the destination of exports)

and by product. Since the beginning of 2013, international trade in goods information has been reported according to the 2012 revision of the Harmonised System nomenclature, i.e. HS Rev.4[1].

Exports and imports of goods are compiled according to *i)* the HS product classification used by the declaring country at the time of its data collection, and *ii)* earlier versions of HS, via standard HS to HS conversion keys in order to provide long time-series; *e.g.* HS 1988 estimates are available from 1988 onwards for many countries.[3]

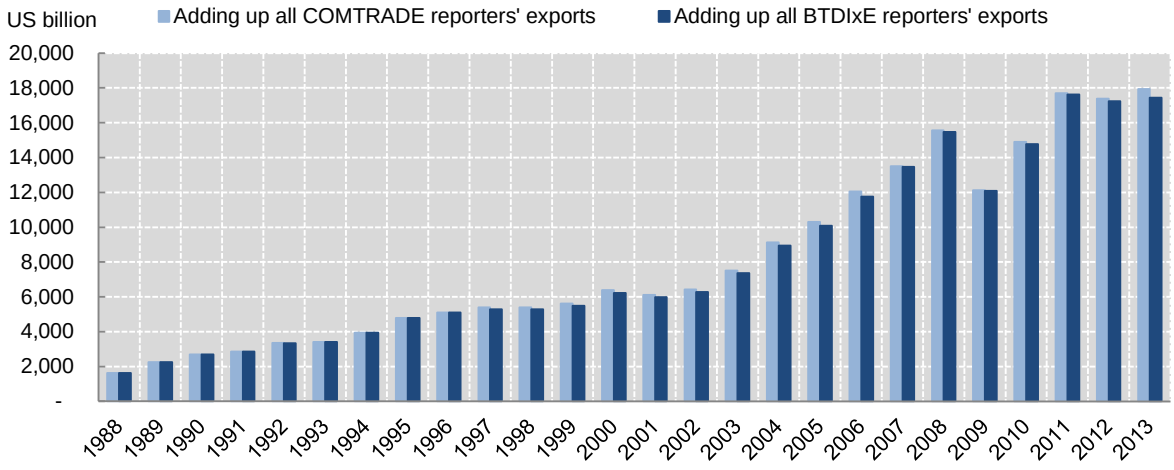
To compile Bilateral Trade Database by activity, each traded product from HS is assigned to a *unique* ISIC industry and a *unique* end-use category. For each declaring country, the conversion into ISIC is achieved by simple aggregation of the appropriate data by product and by partner country. Although, in a sense, the products can be considered as being allocated to the ISIC industries that "typically produce them", here, our method essentially aims at constructing product groups. Therefore, when interpreting the data, users should bear in mind that exports by country *c* of industry *i* products to partner *p* can be associated with country *c*'s output of industry *i*, while imports by country *c* of industry *i* products from partner *p* can be associated with partner *p*'s output of industry *i*. In other words, BTDIxE does not identify country *c's* imports *by* its industry *i*.

For example, Canadian imports of "*transport equipment"* from France, do not reflect the value of imported products by the Canadian *transport equipment* sector coming from any sector in France, but rather, it refers to imports of French "*transport equipment"* products by all sectors in Canada (not only as intermediate inputs but also for household consumption and business investment).

2.2 Reporters and partners

In BTDIxE, trade flows are presented for all OECD reporters and a large number of non-member economies. The list of countries is extended enough to cover most of the major international trade flows and in fact, about 99% of reported global trade is taken into account in BTDIxE. In 2011, the current price value of goods being traded internationally was about 18 USD trillion – a tenfold increase from the late 1980s - see Figure 1.

Figure 1. Total World exports



Sources: United Nations, *Comtrade* and OECD, Bilateral Trade Database by Industry and End-use category (BTDIxE).

For each declaring country, BTDIxE takes into account the bilateral trade flows allocated to approximately 260 partner codes available from the Comtrade/ITCS database, including the partner code for the *World*. In BTDIxE, the values of imports (or exports) allocated to the partner *World* correspond to the sum of the import values (or exports) of all traded goods at 6-digit HS product level,

as reported in Comtrade/ITCS by the declaring country; are also taken into account adjusted values calculated in BTDIxE, aimed at balancing the 6-digit flows with those reported at the 2-digit and total levels (see Section 3.3).

BTDIxE, non-OECD partners were chosen to cover the countries targeted in the 2013 version of the OECD's Inter-Country Input-Output (ICIO) system, the source of OECD-WTO **Trade in Value Added** (TiVA) indicators (see http://oe.cd/tiva). These non-OECD economies are mainly the BRIICS (Brazil, China, India, Indonesia and South Africa), G20 countries other than those already show separately in the database (Argentina, the Russian Federation and Saudi Arabia), selected major South-East Asian economies other than those already shown separately (Brunei Darussalam, Cambodia, Chinese Taipei, Hong Kong China, Malaysia, Philippines, Singapore, Thailand and Viet Nam), the seven non-OECD European Union countries (Bulgaria, Croatia, Cyprus, Lithuania, Malta and Romania) and CEFTA[4] countries (including EU candidates).

The partner *Unspecified* is estimated by adding up 11 country codes related to confidential trade and classified by geography and transport nature (see list hereafter); while the partner *Rest of the World* is calculated by difference (i.e. the sum of reported trade values with all individual partners is subtracted from reported value with partner *World*).

Partner	Comtrade code
South America n.e.s.	473
Oceania n.e.s.	527
Europe n.e.s.	568
Africa n.e.s.	577
America n.e.s.	636
North & Central America n.e.s.	637
Bunkers	837
Free Zones	838
Confidential & differences	839
Other areas n.e.s.	899

Table 1. BTDIxE countries

- **OECD**

Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel[5], Italy, Japan, Korea, Latvia, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States.

- **BRIICS**

Brazil, China (People's Republic of), India, Indonesia, Russian Federation, South Africa.

- **Africa**

Algeria, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Congo, Côte d'Ivoire, Egypt, Ethiopia, Gabon, Gambia, Ghana, Guinea, Kenya, Lesotho*, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome & Principe, Senegal, Seychelles, Sudan, Swaziland*, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe.

- **Latin America and the Caribbean**

Argentina, Aruba, Bolivia, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Jamaica, Montserrat, Nicaragua, Panama, Paraguay, Peru, Saint Kitts & Nevis, Saint Vincent & Grenadines, Suriname, Trinidad & Tobago, Uruguay, Venezuela.

- **Asia**

Bahrain, Bangladesh, Brunei Darussalam, Bhutan, Cambodia, Georgia, Hong Kong China, Iran, Jordan, Kazakhstan, Kuwait, Kyrgyzstan, Lebanon, Macao China, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Oman, Pakistan, Philippines, Qatar, Saudi Arabia, Singapore, Sri Lanka, Syrian Arab Republic, Chinese Taipei, Thailand, United Arab Emirates, Viet Nam, Yemen.

- **Non-OECD European Union (EU)**

Bulgaria, Croatia, Cyprus[6], Lithuania, Malta, Romania.

- **Other Europe**

Albania, Belarus, Bosnia and Herzegovina, Former Yugoslav Republic of Macedonia, Moldova, Montenegro, Serbia, Ukraine.

- **Oceania**

Fiji, New Caledonia, Papua New Guinea, Tonga.

- **Other**

World*, Unspecified* and Rest of the World*.

*Only as partners.

In some cases, data are provided where the declaring and partner countries are identical (e.g. Australia imports from Australia or France exports to France). While for some countries, such data represents re-imports[7] or re-exports of goods, this is not always the case as described in Annex Tables 2 and 3.

2.3 Time-periods

The full version of BTDIxE includes estimates from 1988 onwards. Nonetheless, only data from 1990 are presented in the online version of the database. Hereafter, is the time coverage for some selected major reporters: i.e. all OECD member countries and several non-OECD economies.

Table 2. BTDIxE full version, time coverage for selected reporting countries, *as of June 2017*

OECD	code	time coverage	**OECD**	code	time coverage
Australia	AUS	1988-2016	Japan	JPN	1988-2016
Austria	AUT	1995-2015	Korea	KOR	1994-2016
Belgium[8]	BEL	1988-2016	Latvia	LVA	1994-2016
Canada	CAN	1988-2016	Luxembourg	LUX	1999-2016
Chile	CHL	1990-2016	Mexico	MEX	1990-2016
Czech Republic	CZE	1993-2016	Netherlands	NLD	1988-2015
Denmark	DNK	1988-2016	New Zealand	NZL	1989-2016
Estonia	EST	1995-2016	Norway	NOR	1988-2016
Finland	FIN	1988-2015	Poland	POL	1992-2016
France	FRA	1988-2016	Portugal	PRT	1988-2016
Germany	DEU	1988-2016	Slovak Republic	SVK	1997-2016
Greece	GRC	1988-2016	Slovenia	SVN	1994-2015
Hungary	HUN	1992-2016	Spain	ESP	1988-2016
Iceland	ISL	1988-2016	Sweden	SWE	1988-2016
Ireland	IRL	1988-2016	Switzerland	CHE	1988-2016
Israel[9]	ISR	1995-2016	Turkey	TUR	1989-2016
Italy	ITA	1988-2016	United Kingdom	GBR	1988-2016
			United States	USA	1989/90-2016
Non-OECD	code	time coverage	**Non-OECD**	code	time coverage
Albania	ALB	1996-2016			
Argentina	ARG	1993-2016	Lithuania	LTU	1994-2016
Bosnia & Herzegovina	BIH	2003-2016	FYR Macedonia	MKD	1994-2016
Brazil	BRA	1989-2016	Malaysia	MYS	1989-2016
Brunei Darussalam	BRN	1992-2015	Malta	MLT	1994-2016
Bulgaria	BGR	1996-2016	Moldova, Rep. of	MDA	1994-2016
Cambodia	KHM	2000-2015	Montenegro	MNE	2006-2016
China	CHN	1992-2016	Philippines	PHL	1996-2016
Chinese Taipei	TWN	1990-2016	Romania	ROU	1989-2016
Colombia	COL	1991-2016	Russian Federation	RUS	1996-2016
Costa Rica	CRI	1994-2016	Saudi Arabia	SAU	1991-2015
Croatia	HRV	1992-2016	Serbia	SRB	2004-2016
Cyprus[10]	CYP	1989-2016	Singapore	SGP	1989-2016
Hong Kong, China	HKG	1992-2016	South Africa	ZAF	1992-2016
India	IND	1988-2016	Thailand	THA	1988-2015
Indonesia	IDN	1989-2016	Viet Nam	VNM	2000-2015
Algeria	DZA	1992-2016	Nigeria	NGA	1996-2014
Bangladesh	BGD	1989-2015	Oman	OMN	2000-2016
Belarus	BLR	1998-2016	Peru	PER	1992-2016
Egypt	EGY	1994-2016	Qatar	QAT	2000-2015
Iran	IRN	1997-2011	Tunisia	TUN	1991-2015
Kazakhstan	KAZ	1995-2016	Ukraine	UKR	1996-2015
Kuwait	KWT	2000-2015	United Arab Emirates	ARE	1991-2015
Morocco	MAR	2002-2016	Venezuela	VEN	1994-2013

2.4 End-use categories

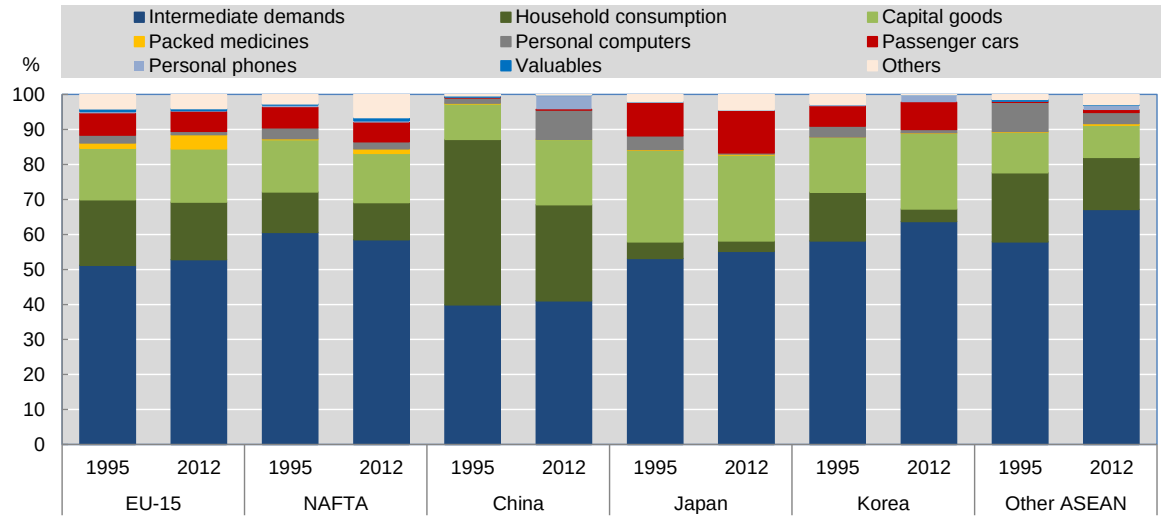
Breaking down trade in goods according to their end-use adds a new dimension to the traditional commodity-based trade statistics and provides a link to National Accounts Input-Output Tables, in which flows of goods and services are reported according to end-users. In the System of National Accounts (SNA), there are generally three basic kinds of domestic end-use categories: *industrial intermediate inputs*, *consumption* (by households and public sectors) and *fixed capital formation* (private and public). Using the detailed classification systems of trade in goods (*i.e.* the Harmonised Systems), bilateral flows of exports and imports can be broadly classified into *intermediate goods*, *household consumption goods* and *capital goods*, notably via the keys developed by UNSD to convert from HS classifications to Broad End-use Categories (BEC).[11]

The BEC classification has been used in various studies. It is roughly based on the characteristics of goods and it allows classifying each HS commodity to one BEC category (see Table 3).

However, research using Supply-Use (SUT) and Input-Output (IO) Tables combined with trade data broken down by BEC hinted at the need to improve the use of this classification, as in the BEC system, the assignation of commodities to end-uses can sometimes be ambiguous and may not be completely relevant to reflect end-uses in the National Accounts. This is notably the case when products can be either for intermediate demand and household consumption, or for capital goods in industries and household consumption. As an example, processed fuels, in the BEC sub-category 32 *Processed fuels and lubricants*, can be consumed by households or firms, while packed medicines, in the BEC 63 *Non-durable consumer goods*, can be purchased by households or hospitals. Another example is the BEC sub-categories 51, *passenger cars* and 61, *durable consumer goods* where small and medium passenger cars as well as personal computers can be purchased by households or firms. Similarly, military equipment (*e.g.* warships, vessels, armoured vehicles and light weapons) can be produced either for intermediate consumption when used by military establishments, or as capital assets when used for non-military purposes. Conventionally, in the National Accounts, goods acquired or used by defence services (except dwellings) have always been considered as intermediate consumption and not as capital formation. According to SNA 1993, to be considered as capital, a good has to be used repeatedly and be continuously in production. Sometimes, only relying on the commodity's characteristics makes the end-use assignment difficult; for example pistols and revolvers, in the BEC sub-category 7 *Goods not elsewhere specified*, can be purchased by households (in which case, they would be considered as household consumption), by security firms or companies engaged in policing activities (in which case, they would go to capital goods), or by military establishments (and thus they would be allocated to intermediates). In SNA 2008, military equipment is recorded as capital goods. To be consistent with Supply and Use Tables and Input-Output Tables, we use the SNA 1993 definition and not the SNA 2008.

Rather than use the HS to BEC / end-use conversions developed by UNSD in their entirety, and to better align trade data with National Accounts, the OECD developed an alternative correspondence table to link HS codes with end-use categories. This introduces five distinct ***mixed end-use categories*** to complement the three major end-use categories mentioned above: ***personal computers, passenger cars, personal phones, packed medicines*** and ***precious goods***. Those additional categories allow to distinguish several consumer-oriented final goods that can be consumed by households, private industries or public sectors (*e.g.* personal computers and phones, but also refined petroleum products), as well as for numerous processed and final consumption products (*e.g.* precious metals and antique arts). Products usually concerned by this distinction are those which may not be deteriorating over time under normal conditions and are acquired and held primarily as stores of value (United Nations, 1993; Eurostat, 1996). For many countries the five additional mixed end-use groups account for less than 10% of the world exports.

Figure 2. Export shares by originating country/zone and end-use category



Source: OECD, Bilateral Trade Database by Industry and End-use category (BTDIxE).

Over the last 15 years or so, the shares of world trade by end-use categories have remained relatively stable while there have been notable changes across regions. For example, in China, the export share of capital equipment has risen while the share of household consumption goods has dropped. Meanwhile, ASEAN countries have experienced a rise in the share of exported intermediate goods.

The nine end-use categories presented in BTDIxE are summarised in Table 4. Users can further refer to BTDIxE industry classification to determine the commodities' characteristics indicated in that table. For example, monetary gold is allocated to industry *Non-ferrous metals* and to end-use category *Intermediate goods*; uncut diamonds are recorded in industry *Other mining and quarrying* and in end-use category *Precious goods*; unworked or unsorted pearls are assigned to industry *Fishing* and to end-use category *Precious goods*; antique arts, collection pieces and worked precious stones (jewellery form) are attributed to industry *Other manufacturing* and to end-use category *Precious goods*.

Table 3. Products groups and National Accounts end-use categories based on UN Broad Economic Category (BEC) classification

<table>
<tr><td colspan="2" rowspan="2"></td><td colspan="4">End-use</td></tr>
<tr><td rowspan="2">Intermediate</td><td colspan="2">Final demand goods</td><td rowspan="2">Other</td></tr>
<tr><td>Household consumption</td><td>Industrial capital goods</td></tr>
<tr><td rowspan="9">Products characteristics</td><td rowspan="2">Primary products</td><td rowspan="2">Food and beverages (111)
Industrial supplies (21)
Fuels and lubricants (31)</td><td></td><td rowspan="2"></td><td rowspan="2"></td></tr>
<tr><td>Food and beverages (112)</td></tr>
<tr><td rowspan="4">Processed unfinished</td><td></td><td>Food and beverages (122)</td><td rowspan="4"></td><td rowspan="4"></td></tr>
<tr><td colspan="2">Fuels and lubricants e.g. gasoline (32)</td></tr>
<tr><td rowspan="2">Food and beverages (121)
Industrial supplies (22)
Parts and components of transport equipment (53)
Parts and components of capital goods (42)</td><td rowspan="2"></td></tr>
<tr><td></td></tr>
<tr><td rowspan="4">Processed finished</td><td colspan="2">Packed medicines (part of 63)</td><td rowspan="2"></td><td rowspan="2"></td></tr>
<tr><td rowspan="3">Warships, military vehicles, vessels, military weapons (part of 7)</td><td>Non-industrial transport equipment (522)
Non-durable consumer goods (63)
Semi-durable consumer goods (62)
Durable consumer goods for households (61)</td></tr>
<tr><td colspan="2">Durable personal consumer goods e.g. personal computers (part of 61)
Mobile phones (part of 41)
Passenger motor cars (51)
Fixed line phones (part of 62)</td><td></td></tr>
<tr><td></td><td>Capital goods (41)
Industrial transport equipment (521)</td><td></td></tr>
<tr><td>Other</td><td colspan="2">Fuel and lubricants (321)</td><td></td><td>Goods n.e.c (7)</td></tr>
</table>

United Nations BEC codes are given in parentheses.

Table 4. BTDIxE end-use categories and trade statistics classifications

BTDIxE End-use, code		BEC	HS 1988	HS 1996 and HS2002	HS 2007	HS 2012
1	Intermediate goods, INT	111, 121, 21*, 22*, 31, 32*, 42, 53, 7*	(01-19, 21-45, 47-56, 58-60, 63, 65-76, 78-85, 87, 89-96)*			
2	Household consumption, CONS	112, 122, 22*, 522, 61*,62*,63*	(02-04, 06-11, 15-24, 30, 32-40, 42-44, 46, 48-52, 54-59, 61-74, 76, 82-85, 87-97)*			
3	Capital goods, CAP	41*, 521	(01, 71, 73, 76, 82-91, 93-96)*			
4	Packed medicines, XMEDIC	63*	3004xx			
5	Personal computers, XPC	41*	8471xx		8471xx, 852841, 852851	
6	Passenger cars, XCARS	51	87032x, 87033x, 87039x			
7	Personal phones (fixed and mobile), XPHONE	41*	852520	852520	851712	
8	Precious goods, XPRCS	21*, 22*	7101xx, 7102xx, 7103xx, 710820, 970400, 970500, 970600			
9	Miscellaneous, XMISC	7*, 32*	2710xx and Commodities not elsewhere specified			

*part of

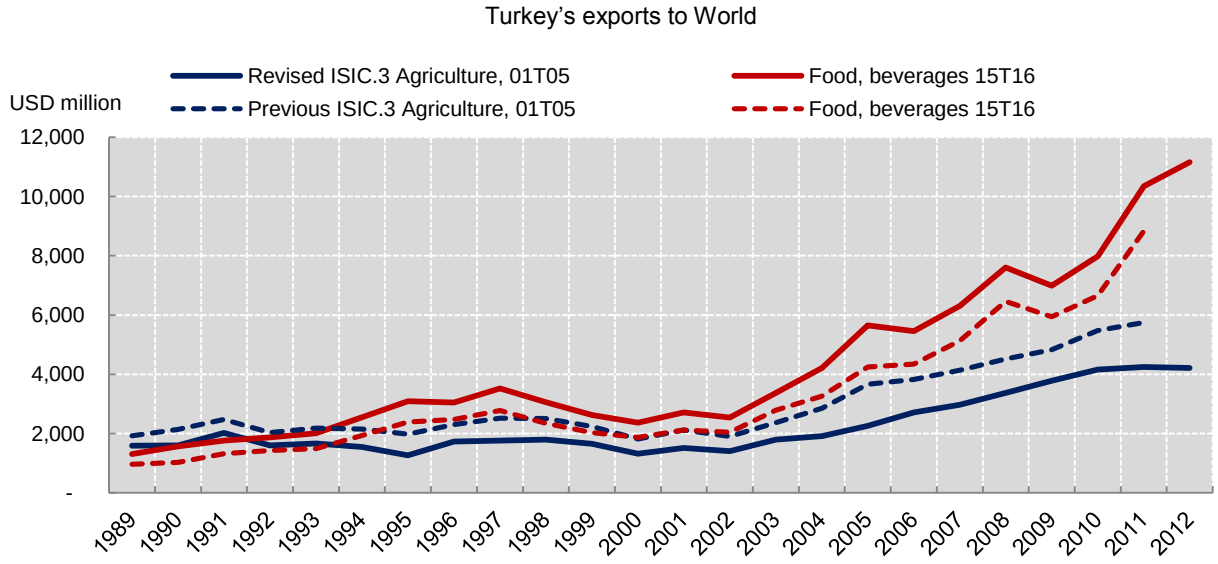
2.5 Economic activities

In its (archived) ISIC Rev.3[12] version, BTDIxE covers 66 detailed and aggregated sectors including technology intensive manufacturing activities[13] (based on the old definition). The ISIC Rev.4[14] version of the database covers more detailed sectors and aggregates, as well as manufacturing activities grouped according to their Research & Development (R&D) intensity[15] (based on the new definition. Additional groups are provided to identify waste and used goods for recycling or disposal, as well as unspecified products (see Table 5). The industry list is compatible with those used in other OECD industrial databases among which the STAN family databases: STAN for Structural Analysis (http://oe.cd/stan), Input-Output Tables (http://oe.cd/i-o) and ANBERD (http://oe.cd/anberd) for Business Enterprise Research and Development.

The HS to ISIC conversion keys, which we developed to construct BTDIxE, may be subject to revisions. For example, in the 2013 edition, some products previously allocated to the industry *Agriculture, Hunting and Forestry* were mapped to *Food and beverages* and vice versa. Likewise, some of the products initially mapped to *Textiles* were attributed to *Wearing apparel* and vice versa. Consequently, for some countries, values observed in *Agriculture, Hunting and Forestry* may have dropped while those for *Food and beverages* may have increased (see Figure 3); values for Textiles may be lower and those for Wearing apparels may be higher.

Furthermore, any goods previously allocated to the industry *Electricity* now appear in the sector *Other activities*; a few waste and used products, previously attributed to *Other manufacturing waste*, are now classified in *Other waste not elsewhere specified* (*e.g. Used pneumatic tyres* initially allocated to industry *Waste rubber and plastics*), or as by-products in which case they are attached to the industry which originally generated them (*e.g. Parings and other waste of leather* now directly goes to *Waste leather* instead of broad sector *Waste textiles*). Part of the confidential trade, previously assigned to the highest level of industry aggregation, is re-allocated to some detailed industry levels, *e.g.* confidential trade going to the "parent" industry *Motor vehicles and transport equipment* now goes to the "child" industry *Motor vehicles, trailers and semi-trailers* which may result in higher values observed for the latter.

Figure 3. Example of shifts in values resulting from changes in HS to ISIC conversion key (2013 edition):



Source: OECD, Bilateral Trade Database by Industry and End-use category (BTDIxE).

Table 5. BTDIxE industries

Industry	ISIC Rev. 3
GRAND TOTAL	**01t99**
Primary and Manufactured goods	**01t37**
Agriculture, Hunting, Forestry and Fishing	**01t05**
...Agriculture, hunting	01
...Forestry, logging	02
...Fishing	05
Mining and Quarrying	**10t14**
...Mining of coal and lignite; extraction of peat	10
...Extraction of crude petroleum and natural gas	11
...Mining of uranium and thorium ores	12
...Mining of metal ores	13
...Other mining and quarrying	14
Total Manufacturing	**15t37**
Food, beverages and tobacco	15t16
…Food, beverages	15
…Tobacco	16
Textiles, leather and footwear	17t19
…Textiles, textile products	17
…Leather	18
…Footwear	19
Wood and products of wood and cork	20
Pulp, paper, printing and publishing	21t22
…Pulp, paper, paper products	21
…Printing and publishing	22
Chemical, rubber, plastics and fuel products	23t25
…Coke, refined petroleum products and nuclear fuel	23
...Chemicals and chemical products	24
……Chemicals excluding pharmaceuticals	24 excl. 2423
……Pharmaceuticals	2423
…Rubber and plastic products	25
Other non-metallic mineral products	26
Basic metals and fabricated metal products	27t28
…Basic metals	27
……Iron and steel	271, 2731
……Non-ferrous metals	272, 2732
…Fabricated metal products	28
Machinery and equipment	29t33
…Machinery and equipment not elsewhere classified	29
…Electrical and optical equipment	30t33
……Office, accounting, computing machinery	30
……Electrical machinery and apparatus not elsewhere classified	31
……Radio, television and communication	32
……Medical, precision and optical Instruments	33
Transport equipment	34t35
…Motor vehicles, trailers and semi-trailers	34
…Other transport equipment	35
……Building and repairing of ships and boats	351
……Aircraft and spacecraft	353
……Railroad and transport equipment, not elsewhere classified	352, 359
Manufacturing not elsewhere classified; Recycling	36t37
Other activities	40t41, 72, 74, 92, 93
Total Waste	
…Waste textiles	…Ferrous scrap metals
…Waste paper	…Non-ferrous scrap metals
…Chemical waste	…Other waste not elsewhere specified
…Waste rubber and plastics	
Confidential and unallocated	
Adjustment	
High-technology	2423, 30, 32, 33, 353
Medium-high technology	24 excl. 2423, 29, 31, 34, 352, 359
Medium-low technology	23, 25, 26, 27t28, 351
Low-technology	15t16, 17t19, 20, 21t22, 36t37
Information and Communication Technology	30, 313, 32, 3312, 3313

Table 5. BTDIxE industries (continued)

Activity	ISIC Rev.4	Proxy in ISIC Rev.3
GRAND TOTAL	**TOTAL**	**01t99**
Primary and Manufactured goods	**01T32**	**01T37**
Agriculture, Hunting, Forestry and Fishing	**01T03**	**01T05**
...Crop and animal production, hunting	01	01
...Forestry and logging	02	02
...Fishing and aquaculture	03	05
Mining and Quarrying	**05T08**	**10T14**
...Mining of coal and lignite	05	10
...Extraction of crude petroleum and natural gas	06	11
...Mining of metal ores	07	12, 13
...Other mining and quarrying	08	14, 10, 11
Manufacturing	**10T32**	**15T37**
Food, Beverages and Tobacco	10T12	15T16
…Food	10	15
…Beverages	11	15
…Tobacco	12	16
Textiles, Leather and Footwear	13T15	17T19
…Textiles	13	17
…Wearing apparel	14	18
…Leather and related products	15	19
Wood and Products of Wood and Cork	16	20
Paper and Printing	17T18	21T22
…Paper and paper products	17	21, 22
…Printing and reproduction of recorded media	18	22, 21
Chemicals, rubber, plastics and fuel products	19T22	23T25
…Coke and refined petroleum products	19	23
…Chemical and pharmaceutical products	20T21	24
……Chemicals and chemical products	20	24 excl. 2423
……Basic pharmaceuticals and preparations	21	2423
…Rubber and plastic products	22	25
Other non-metallic mineral products	23	26
Basic metals and fabricated metal products	24T25	27T28
…Basic metals	24	27
……Iron and steel	241, 2431	271, 2731
……Non-ferrous metals	242, 2432	272, 2732
…Fabricated metal products	25	28
Machinery and equipment	26T28	29T33
…Computer, electronic and optical products	26	30, 32, 33
……Computers and peripheral equipment	262	30
……Electronic, optical products; scientific instruments	26 excl. 262	32, 33
…Electrical equipment	27	31
…Machinery and equipment not elsewhere classified	28	29
Transport equipment	29T30	34T35
…Motor vehicles, trailers and semi-trailers	29	34
…Other transport equipment	30	35
……Building of ships and boats	301	351
……Air and spacecraft and related machinery	303	353
……Military fighting vehicles	304	29
……Railroad and transport equipment not elsewhere classified	302, 309	352, 359
Furniture; Other manufacturing	31T32	36T37
Electricity and gas	35	40
Other activities	36T99	41, 72, 74, 92, 93
Total Waste		
…Waste textiles	…Waste paper	
…Chemical waste	…Waste rubber and plastics	
…Ferrous scrap metals	…Non-ferrous scrap metals	
…Other waste not elsewhere specified		
Confidential and unallocated	**Adjustment**	
Mining and manufacturing of iron and steel *	071, 241, 2431	
Mining and manufacturing of non-ferrous metals *	072, 242, 2432	

High R&D intensive industries	21, 26, 303	
Medium-high R&D intensive industries **	20, 27, 28, 29, 302, 304, 309	
Medium R&D intensive industries	22, 23, 24, 301, 32 *less* 325	
Medium-low R&D intensive industries	10T12, 13T15, 16, 17T18, 19, 25 *less* 252, 31	
Information and Communication Technology (ICT)	26 excl. 265, 266, 267	

* Mining of iron ores (071) and Mining of non-ferrous metal ores (072) are not shown separately in the above list.

** Also includes weapons and ammunitions (252), medical and dental instruments and supplies (325), not shown separately.

Further reading about OECD, R&D intensive taxonomy: OECD taxonomy of economic activities based on R&D intensity.

3. METHODOLOGY AND DATA COMPILATION

3.1 Conversion keys from HS to industries and end-uses

The Harmonised System (HS) is an international coding system for commodities hosted by the World Customs Organisation (WCO) which is revised every five years. There are currently five versions of HS from 1988 onwards.[16] HS Rev. 4 (2012) entered into force on 1 January 2012. Though the main 2-digit chapters of each version of HS are similar, some detailed coding at the 6-digit level can be very different, especially for the Information and Communication Technology (ICT) commodities reflecting significant technological changes in recent years (i.e. starting from HS 2002).

In the old versions of Bilateral Trade Database (BTD), trade values were extracted for all commodities in HS 1988 (converted from later versions of HS to maximise the time coverage) and then aggregated into industries by applying a standard HS 1988 to ISIC Rev.3 conversion key which was developed internally by the OECD Directorate for Science, Technology and Innovation.

This methodology could nevertheless result in a loss of information (notably as regards ICT goods) owing to some "one-to-many" and "many-to-many" backward correspondences across HS versions, which were difficult to condense into useable "one-to-one" or "many-to-one" backward conversions, and also due to the nature of the HS-HS conversions themselves (see Box 1).

Box 1. HS to HS conversions in Comtrade and ITCS

The conversion keys used in the ITCS and COMTRADE databases to convert trade data from HS 2007 to HS 2002 and to earlier versions of HS, only pass trade values at the 6-digit level and then only for regular HS codes (*i.e.* excluding any special codes *e.g.* related to confidential data). Once converted, *e.g.* from HS 2007 to HS 2002, values at the 2-digit level are calculated as the sum of the converted 6-digit level data. This can lead to breaks in series, since any missing 6-digit information identified upstream in HS 2007 is neither passed to HS 2002, nor to earlier versions of HS.

For example, a difference of 90% can be observed in 2009 for chapter 88 *Aircraft, spacecraft and parts thereof* when comparing US reported exports with the World in HS 2007 with those reported in HS 2002 (see Annex Table 5 as a brief illustration of this issue). In the case of the US, such a discrepancy has a significant impact at the industry level and can affect the reported trade values to all its trading partners too.

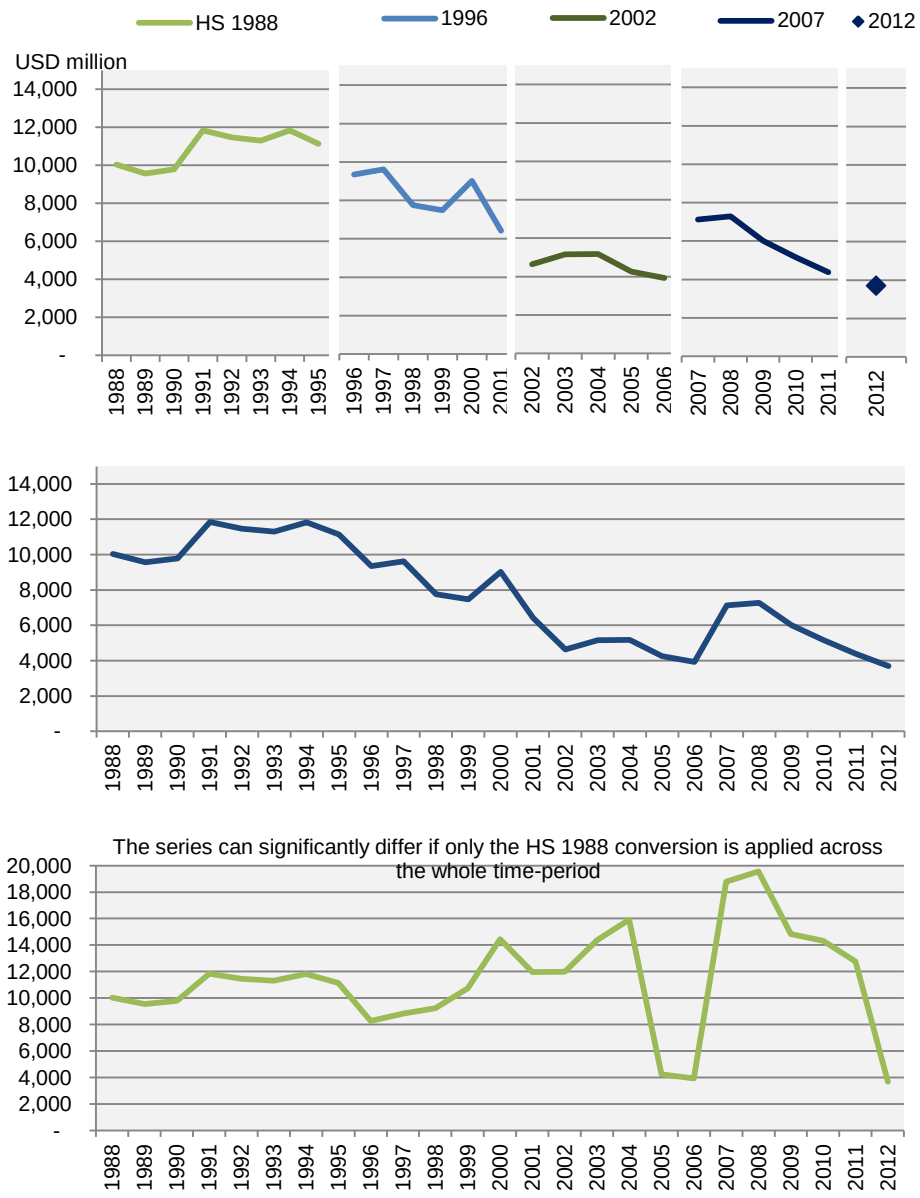
To avoid this loss of information, that reflects existing inconsistencies between different HS versions and affects more particularly the years after 2002, the OECD set up five conversion tables (*i.e.* one for each version of HS) enabling to map merchandise trade data to ISIC industries[17] and end-use categories. As mentioned earlier, BTDIxE standard conversion keys are drawn from the various concordance tables published by UNSD[18] and summarised in Table 6 hereafter.

In BTDIxE, time-series for reporters are built by combining trade values at 6-digit extracted from all versions of HS published in ITCS and Comtrade databases according to the time-periods for which the reported HS values are available. This means that long time-series by reporters and products are generated by fixing as the starting year of each HS version, the year following the latest available year of the previous HS version. In other words, for each HS version, the maximum year used for building the time-series would be adjacent to the minimum year available in the subsequent HS version, so to avoid discontinuities in the data.

As a result, for most reporters, trade values from HS 1988 are used for the time-period 1988-1995, values from HS 1996 for 1996-2001, values from HS 2002 for 2002-2006, values from HS 2007 for 2007-2011 and values from HS 2012 from 2012 onwards (Figure 6). A full picture of data availability, as reported by declaring countries and per HS, is given in Annex Table 1.

Figure 4. Example of linkage across HS versions to build long time-series

Japanese exports of TV, radio transmitters, apparatus for telephony and telegraphy, to partner World



Source: OECD, Bilateral Trade Database by Industry and End-use category (BTDIxE).

Table 6. Conversion keys generated for ISIC3 and ISIC4 BTDIxE using existing UNSD correspondence tables

	To	ISIC Rev. 3		ISIC Rev.4	End use categories (EUC)	
		origin	*via*		*origin*	*via*
From	HS 1988	OECD	UNSD HS88 - HS96 UNSD HS96 - ISIC3		OECD	UNSD HS88 - HS96 OECD HS96 - EUC*
	HS 1996	UNSD	UNSD HS96 - ISIC3	ISIC3 - ISIC3.1 ISIC3.1 - ISIC4	OECD	UNSD HS96 - BEC (part)
	HS 2002	OECD	UNSD HS02 - ISIC3.1	ISIC3.1 - ISIC4	OECD	UNSD HS02 - BEC (part)
	HS 2007	OECD	UNSD HS07 - ISIC4 UNSD ISIC4 - ISIC3.1 OECD previous HS07 - ISIC3	UNSD HS07 - CPC2 UNSD CPC2 - ISIC4	OECD	UNSD HS07 - BEC (part) OECD HS02 - EUC** (part) UNSD HS07 - HS02
	HS 2012	OECD	UNSD HS07 - CPC2 UNSD CPC2 - ISIC4 OECD HS07 - ISIC3	UNSD HS07 - HS12 OECD HS07 - ISIC4	OECD	UNSD HS07 - BEC (part) OECD HS07 - EUC** (part) UNSD HS07 - HS12

BEC part: certain HS products have been allocated to end-use categories different to those implied by UNSD HS - BEC - end-use conversions (see UNSD classification registry).

The OECD's conversion key from the Harmonised System 2007 (HS07) to ISIC revision 4 (ISIC4) is broadly based on a concordance developed by UNSD which maps HS07 commodities to ISIC4 economic activities via the Central Product Classification version 2 (CPC2).

When linking from HS classifications to ISIC industries and end-uses, we use the following approach (examples of the conversions resulting from our approach are shown in Table 7):

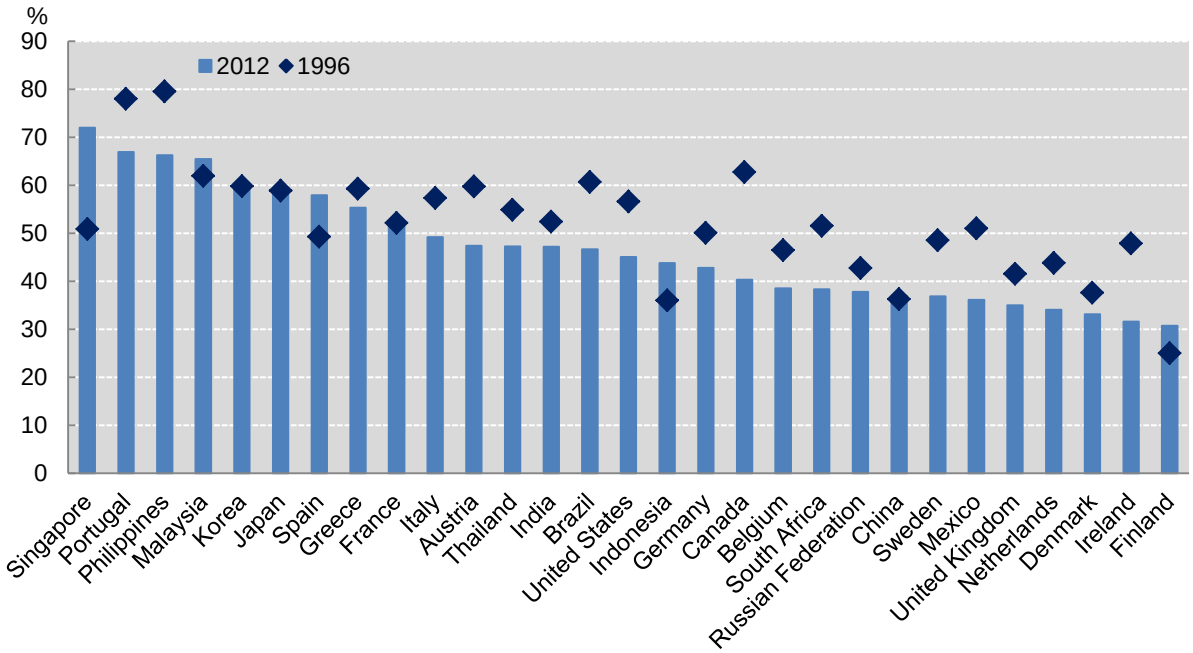
- Each HS commodity code is assigned to a unique ISIC industry code and to a unique end-use.
- Allocations to ISIC are operated at the 4-digit level, wherever possible. If a product code can neither be assigned at the 4- nor at the 2-digit level of ISIC, it is then attributed to a division level or a combination of 2-digit industries.
- Commodities related to special and confidential trade are mapped to ISIC codes, wherever possible.
- Commodities not specified according to kind are attached to the industry *unallocated*.
- Scrap and waste are differentiated as much as possible into by-products from industrial production and post-consumption scrap and waste for recycling or disposal.

Table 7. Example of BTDIxE conversion from HS 2002 to ISIC and end-use

Product description	HS 2002	ISIC3 industry	ISIC4 industry	End-use category
Wheat / Meslin Flour	1101.00	1531	1061	1 Intermediate goods
High voltage fuses	8535.10	3120	2710	1 Intermediate goods
Milk and cream processed	0401.10	1520	1050	2 Household consumption
Men's/boys' shirts of cotton	6105.10	1810	1410	2 Household consumption
Wearing apparels confidential	61CF.00	1810	1410	2 Household consumption
Trucks	8704.21	3410	2910	3 Capital goods
Computers with unitary housing structure	8471.41	3000	2620	5 Personal computers
Gasoline motor vehicles less than 1000cc	8703.21	3410	2910	6 Passenger cars
…	…	…	…	…
Chemical products confidential	37CF.00	2429	2029	9 Other

Figure 5 shows the shares of intermediate goods in exports of *Electrical and optical equipment* (ISIC Rev.3 30t33) for selected OECD, BRIICS and S.E. countries. Trends in intermediate goods trade are indicative of evolving international production processes as country specialisation in manufacturing certain parts, components and partially manufactured subassemblies or assembling final goods changes over time.

Figure 5. Shares of intermediates in electrical and optical equipment exports, selected countries



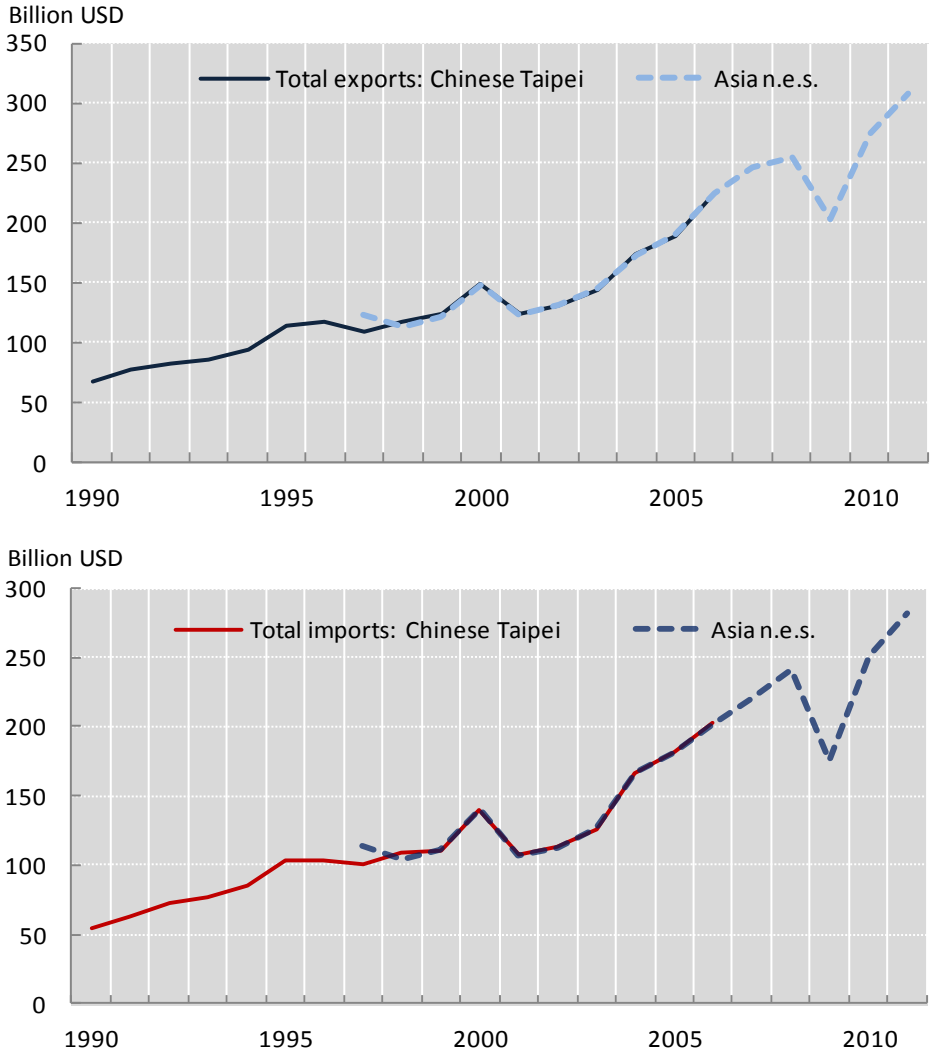
Source: OECD, Bilateral Trade Database by Industry and End-use category (BTDIxE).

3.2 Country specific treatments

Where there is limited time coverage in the source databases ITCS and Comtrade, series for some reporters are extended. For example, trade values for the reporter Chinese Taipei (country code 158) were collected and compiled by the OECD over the period 1990-2006. When comparing ITCS data for reporter Chinese Taipei with Comtrade data for reporter Asia *not elsewhere specified* (country code 490)[19], for each partner and each 2-digit HS chapter, it turns out that both sets of values are sufficiently similar, so that the series for Asia n.e.s. can legitimately be used to extend the series for Chinese Taipei from the year 2007 (Figure 6).

Figure 6. Example of linkage between country codes to build long time-series for some reporters

Chinese Taipei and Asia *not elsewhere specified* trade flows with partner World



Sources: OECD, *International Trade by Commodity Statistics* (ITCS) and United Nations, *Comtrade*.

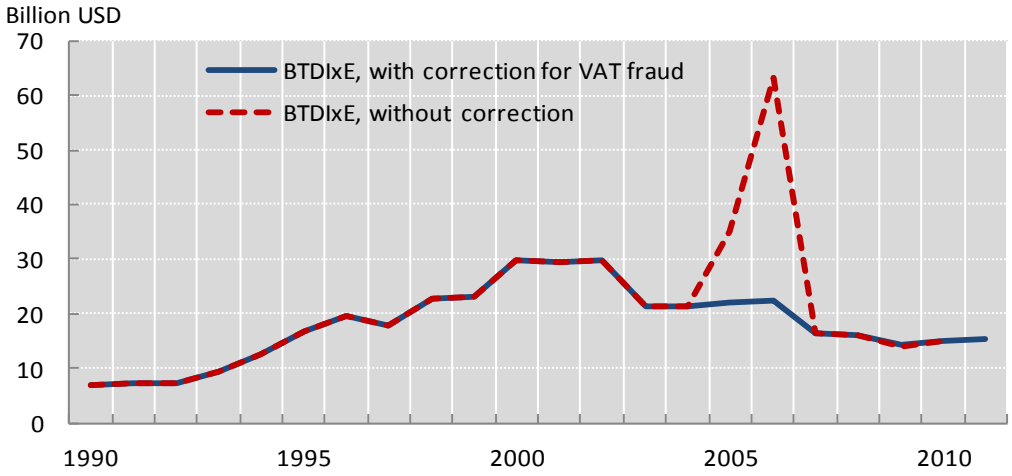
Similarly, trade values reported by Belgium (country code 56) are extended backwards over the period 1988-1992 using data reported by the Union of Belgium-Luxembourg (country code 58), and data for reporter South Africa (country code 710) are extended backwards over the period 1992-1999 using series reported by the South Africa Customs Union (country code 711).

With the view to getting consistent bilateral trade flows, we have developed several country specific data treatments that we apply in case of missing information or erroneous / extreme values.

As an example, we make adjustments to minimise the impact of Missing Trader Intra-Community (MTIC)[20] VAT fraud in the United Kingdom which affects the reported exports of HS product 8525.20 *Transmit-receive apparatus for radio, TV* for which we observed a massive rise in 2005 and 2006, to nearly 10% of UK's total exports in 2006, then followed by a significant drop of 97% in 2007[21]. As a result, exports and imports for ISIC industries *manufacture of communication equipment*, *Radio, television & communication equipment*, and other related industries are affected. De facto, UK's trading partners mainly concerned are EU countries. To a lesser degree, this phenomenon can also be observed for UK imports. In BTDIxE, UK trade with its EU partners as regards HS commodity 8525.20, as well as other products such as digital cameras, smart cards and computers, are corrected by interpolation, in particular for years 2005 and 2006 (Figure 7).

Figure 7. Impact of VAT fraud on Radio, TV and Communication equipment

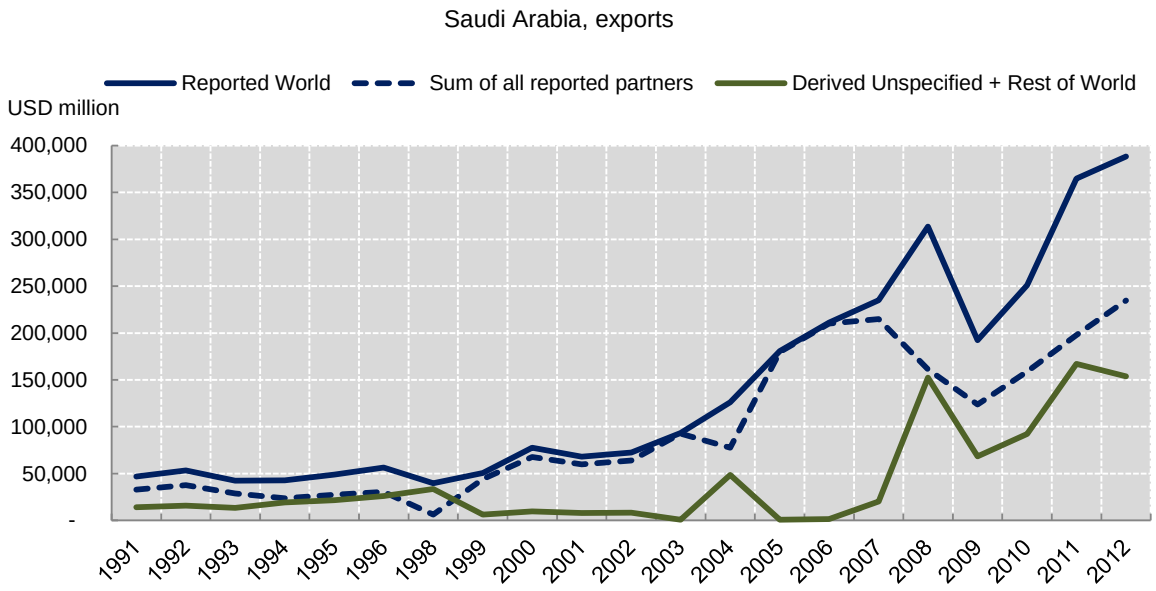
United Kingdom, exports



Source: OECD, Bilateral Trade Database by Industry and End-use category (BTDIxE).

Another specific treatment is applied to Saudi Arabia exports. In Comtrade, Saudi Arabian exports by partner country are not reported for several years, particularly in 2004 and from 2007 onwards. Missing observations can have a significant impact when comparing aggregated export values for all reported partners with values reported to World by Saudi Arabia (as illustrated in Figure 8). This may notably influence the residual values calculated for partners *Unspecified* and *Rest of the World*, which consequently, may show erratic trends over the whole time-period. Also, Saudi exports to the partner *Asia not elsewhere specified* as reported in Comtrade are treated differently than Saudi imports from this partner (*i.e.* currently the reported exports in Comtrade not only cover flows to Chinese Taipei but also to other Asian economies, whereas the reported imports from the partner Asia *not elsewhere specified* mainly correspond to that from Chinese Taipei).

Figure 8. Impact of missing values by partner



Sources: United Nations, *Comtrade* and OECD, Bilateral Trade Database by Industry and End-use category (BTDIxE).

In BTDIxE, we attempt to fill in the gaps for Saudi's exports by partner using official national currency estimates available from year 2001 in the *Exports Statistics Bulletins* and downloaded from the Central Department of Statistics and Information[22]. We assume that, the reported Comtrade exports to partner World are 'correct' and consistent for the whole time-period covered (*i.e.* currently 1991-2012) as well as the reported exports to all individual partners for the years 2003, 2005, 2006. Based on this assumption, missing total exports by partner are estimated by applying shares from Saudi national data to the total World exports given in Comtrade. Estimates by product at the 6-digit level are then calculated by applying to the presumably Comtrade 'correct' exports, the product shares in total exports. Final estimated exports from 2001 broadly reflect the official data as published in the *Exports Statistics Bulletins*, while estimates for years 1999 and 2000 are typically Secretariat's calculations based on 2003 fixed partner shares. So far, we have not attempted to bring adjustments to Comtrade Saudi Arabia's exports for years prior to 1999, owing to difficulties in accessing to historical export flows detailed by trading partners.

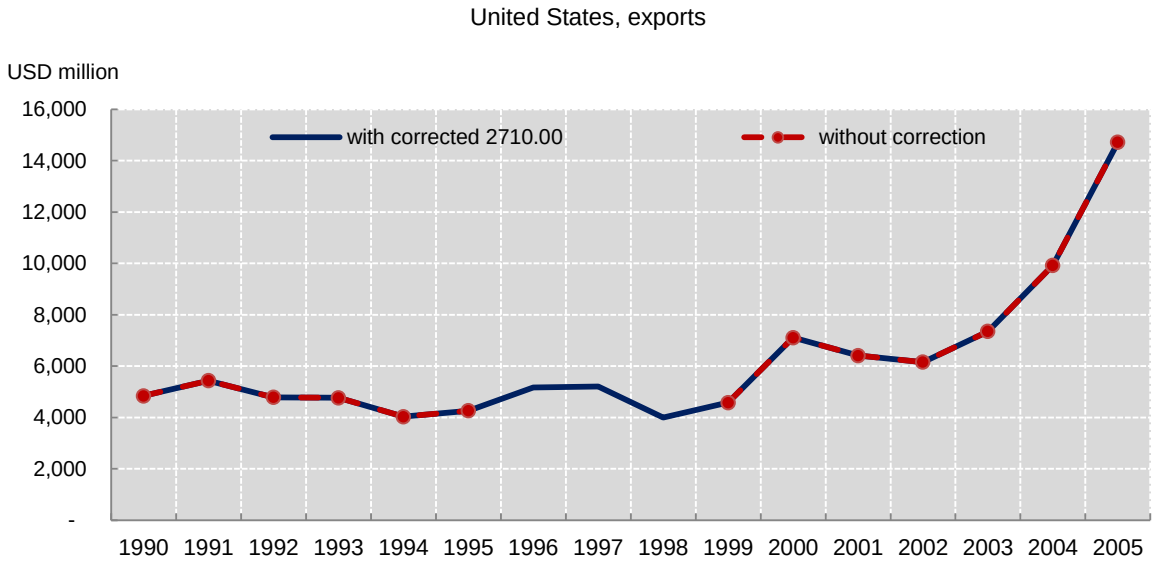
3.3 Product specific adjustments

To build up BTDIxE, initial Comtrade /ITCS values are successively balanced between the 2- and 6-digit levels per chapter, and then between the 0- and 6-digit levels. This is operated by calculating the differences between the "parents" and their "children", for both imports and exports, all declaring countries, all partners, all years and all HS commodities.

The differences per HS chapter, which result from the first round of adjustments (i.e. when balancing the "parents" at 2-digit with the values of their "children" at 6-digit) are assigned to some artificial codes solely created for the purpose of BTDIxE. In practice, when running our conversion keys, this means that if the 2-digit HS products can be allocated to one explicit ISIC industry/end-use category, then the differences between the values at the 2- and 6-digit levels are allocated to the same corresponding ISIC industry / end-use category. When the corresponding ISIC division / end-use category cannot be determined, the differences between the 2- and the 6-digit levels are then added up and allocated to the industry "Confidential and Unallocated" and to the residual end-use category "Miscellaneous", respectively. Differences which may occur at the second round of adjustments (i.e. when balancing between the 0- and 6-digit levels, including the artificial codes calculated in first round) usually reflect the overall inconsistencies which can exist when countries' aggregate data is reported differently than that data at the detailed level. In BTDIxE, negative differences (*i.e* when the reported values for 6-digit "children" exceed that of their "parents" at 2- or 0-digit level) are reported in the residual industry "Adjustment" and the end-use category "Miscellaneous", thus highlighting the declaring countries for which several consistency issues exist in underlying databases Comtrade /ITCS.

In some cases, we also have to deal with anomalies which affect numerous declaring countries regarding their reported trade for commodity *Oils petroleum, bituminous, distillates, except crude* at the 4- and 6-digit levels (HS codes 2710 and 2710.00, respectively). In HS, the product code 2710.00 is by definition the unique "child" of 2710, and as such, trade values for commodity 2710.00 should equal those for 2710. However, in Comtrade/ITCS, values for a few reporters are missing for 6-digit product 2710.00 although they are reported for 4-digit product 2710. This anomaly which mainly concerns years prior to 2001 and affects in majority non-OECD economies (such as Argentina, Brazil, China, Hong Kong, Indonesia, Malaysia, Singapore, Russian Federation, etc.) but also, and to some lesser extent, a few OECD countries (such as Chile, Poland and the United States). In BTDIxE, this problem is solved by allocating to HS 2710.00 the values given at 4-digit for HS 2710. Without this adjustment, trade estimates can be distorted, as is the case for ISIC industry *Coke, Refined Petroleum Products and Nuclear Fuel*, and related industries (see Figure 9).

Figure 9. Impact of missing HS 2710.00 on Coke, refined petroleum products and nuclear fuel



Source: United Nations, *Comtrade*.

3.4 Confidential trade

Over the past years, the OECD and UNSD have worked together to agree on the best statistical treatment of all aspects relating to international trade data and to align their respective data processing practices. Additional information regarding methodological changes and the operational UNSD-OECD Joint Trade Data Collection and Processing System, is available from OECD ITCS Internet page.[23] It is worth noting that both organisations should have progressively identical data for all years as they are aligning their historical data to improve the quality of their databases.

Despite that, users should bear in mind that there are a number of problems associated with the trade estimates presented in BTDIxE. While most of the issues are rather inherent in all international trade data sets and not unique to BTDIxE, some of them are linked to the methodologies used in the underlying sources ITCS and Comtrade for converting international trade in goods reported in the latest versions of HS (*i.e.* 2007 and somewhat 2012), to earlier versions of the HS.

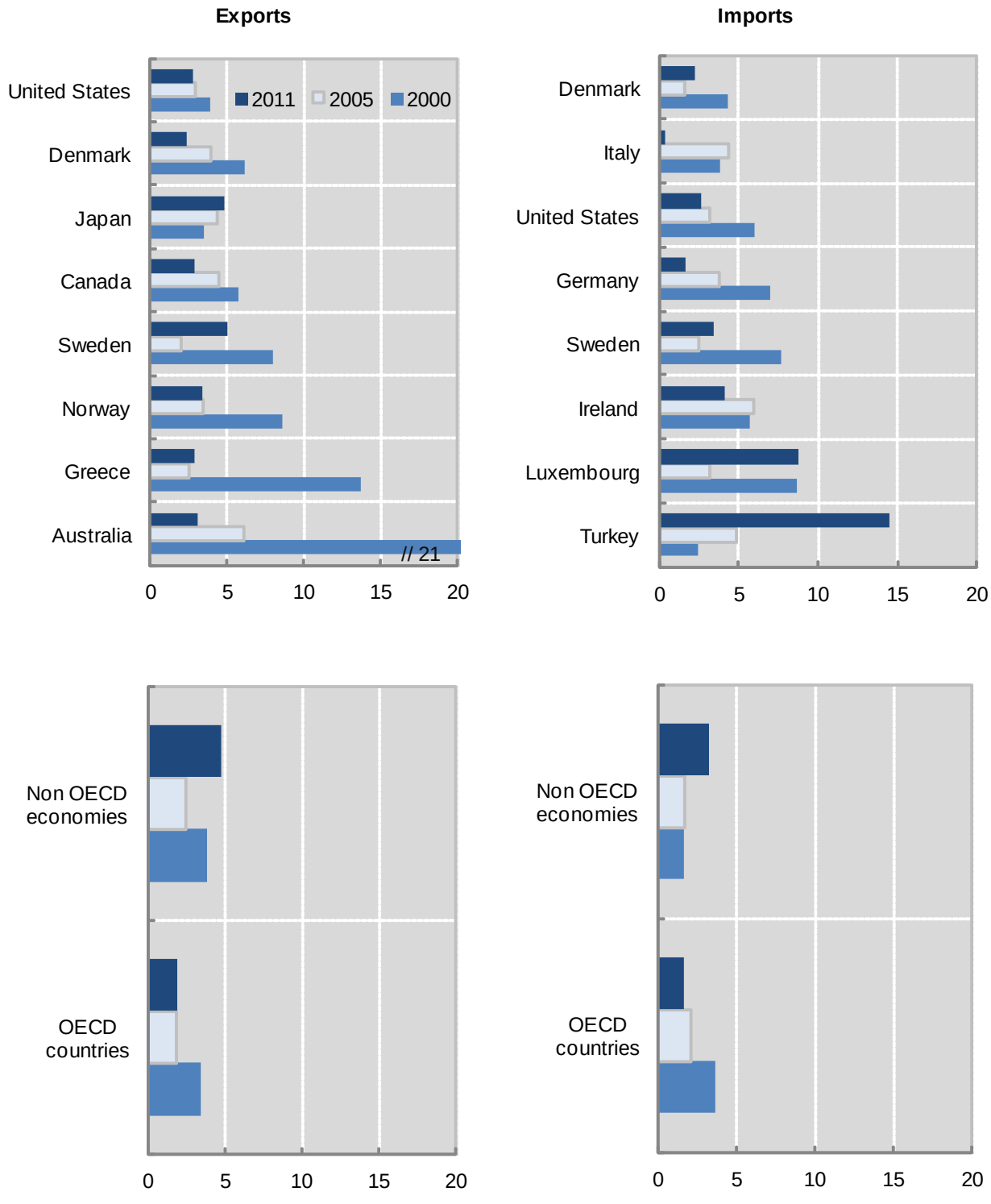
In ITCS, some special codes (or memorandum items) exist at the 6-digit level of HS to deal with confidential or special trade. However, these codes have not been systematically used in recent years meaning that discrepancies may arise when comparing trade flows at the 2- and 6-digit levels. In other words, values for 2-digit level "parents" can significantly differ from the sum of their 6-digit level "children" (see Section 3.3). In Comtrade and ITCS, the product code 99 corresponds to the difference between the reported Total value for all products and the ∑2-digits values, whereas the product code 9999.99 corresponds to the difference between the reported Total value of all products and the ∑6-digits values so that in the end, the value attributed to 9999.99 exceed that for 99.

A good example for illustrating how data quality can be affected is to consider the unallocated or confidential trade which corresponds to value of trade not allocated to any regular (HS or SITC) product codes and/or not recorded by partner country, due to confidentiality or other reasons such as incomplete or ambiguous information. In the source database ITCS, it stems from the category "commodities not specified according to kind" (for products) and from "other areas not elsewhere specified" (for partners).

The share of unallocated or confidential trade in total trade varies across reporters (for several countries the treatment of confidential is mixed and changes over time) and is often likely to be concentrated in certain groups of products (or industries), partners and sometimes certain years, so that comparisons should be made with caution.

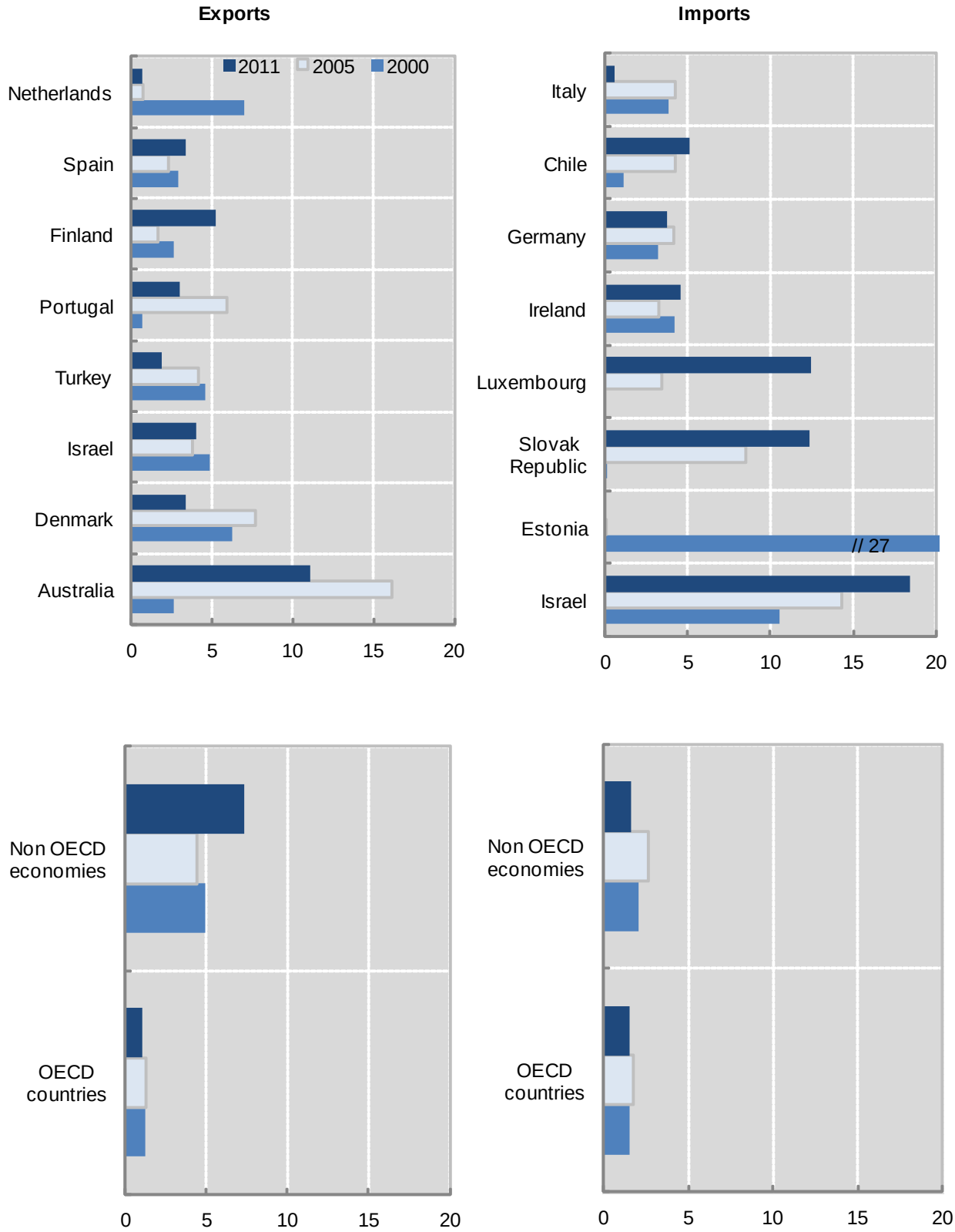
In BTDIxE, we try to manage the impact of confidential trade by adjusting for any differences between the data at the 2-digit level of HS and the sum of the corresponding 6-digit data (see Section 3.3). Figures 10 and 11 give an overview on the reporters (OECD and Non-OECD) where the problem of unallocated or confidential trade can be significant at the 6-digit level of the HS classification. The first two bar charts illustrate the share of unallocated or confidential trade in total trade (*i.e.* trade which is not allocated to any particular product/industry), while the last two show the share of other areas not elsewhere specified in total trade (*i.e.* trade which is not allocated to any particular partner country). Note that for some countries, the prevalence of unallocated or confidential trade may be high in the first release of annual merchandise trade statistics but then reduced in subsequent revision(s).

Figure 10. Share of unallocated products or confidential trade in total trade, in %



Source: OECD, Bilateral Trade Database by Industry and End-use category (BTDIxE).

Figure 11. Share of unspecified partners in total trade, in %



Source: OECD, Bilateral Trade Database by Industry and End-use category (BTDIxE).

3.5 Waste and used goods for re-use, recycling or disposal

Industrial and environmental researchers pay particular attention to the increasing international trade of used and goods for recycling as well as trade in assorted waste. It has become quite important to distinguish resold items and recycled products from waste; this detailed information is useful for I-O analysts notably to identify imported inputs to produce new industrial goods and to distinguish second-hand goods from those stemming from recent manufacturing production and waste products. In BTDIxE where possible, we differentiate between scrap and waste as by-products from industrial production and 'post-consumption' scrap and waste, whether for recycling or disposal. Table 8 shows the top 10 exporters and importers of waste among BTDIxE major declaring countries.

Table 8. Top 10 exporters and importers of used, recycled and waste materials

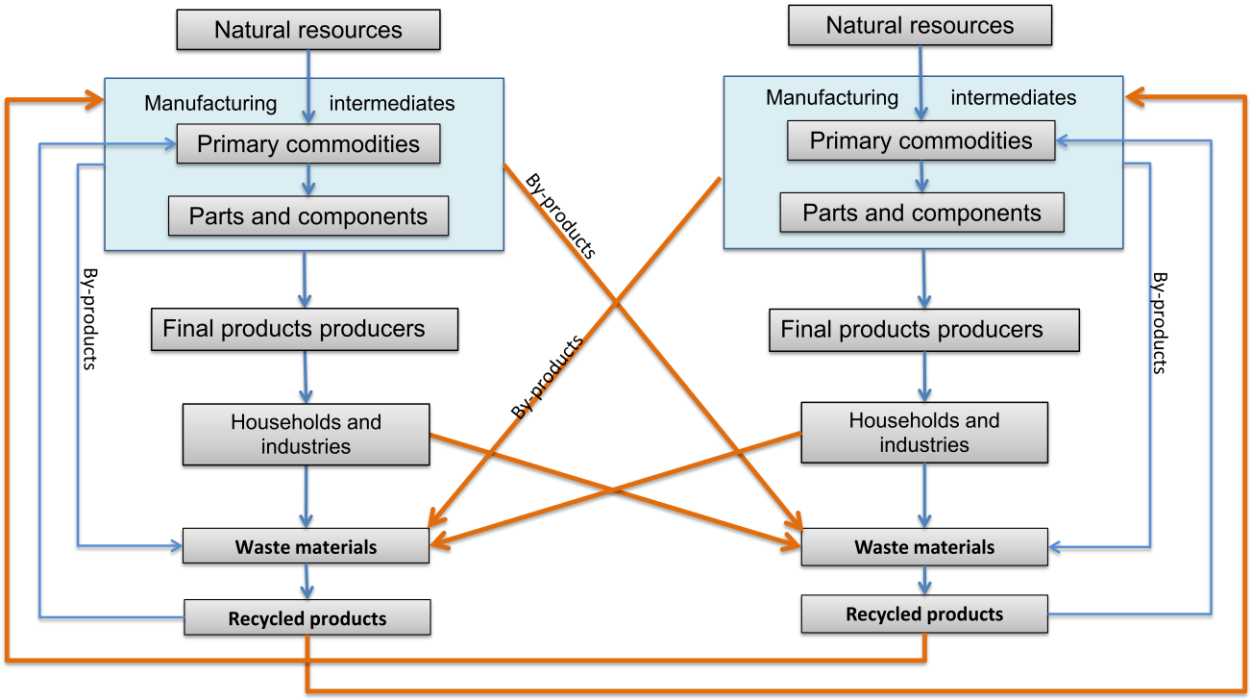
Values in USD million (percentage shares of global trade in waste products)

Top 10 exporters				Top 10 importers			
	1995	2012			1995	2012	
United States	6,429 (28)	28,409 (21)	United States	Germany	2,724 (10)	35,912 (24)	China
Germany	3,348 (14)	13,206 (10)	Germany	Italy	2,243 (8)	12,896 (8)	Germany
Nether-lands	1,725 (7)	10,556 (8)	United Kingdom	United States	1,902 (7)	9,814 (6)	Turkey
France	1,525 (7)	9,259 (7)	Japan	Korea	1,890 (7)	9,551 (6)	Korea
Hong Kong, China	1,314 (6)	7,925 (6)	Nether-lands	Belgium	1,543 (5)	8,578 (6)	India
United Kingdom	1237 (5)	6503 (5)	France	Hong Kong, China	1534 (5)	7158 (5)	United States
Canada	1136 (5)	5363 (4)	Canada	Japan	1483 (5)	5878 (4)	Italy
Belgium	823 (4)	3646 (3)	Belgium	Netherlands	1409 (5)	5609 (4)	Belgium
Mexico	581 (2)	2862 (2)	Spain	Canada	1405 (5)	4525 (3)	Spain
Japan	475 (2)	2601 (2)	Hong Kong, China	Spain	1272 (4)	4212 (3)	Nether-lands

Source: OECD, Bilateral Trade Database by Industry and End-use category (BTDIxE).

Previous studies (*e.g.* van Beukering *et al*., 2000) have introduced the idea of combining input-output analysis with life cycle assessment and revealed the significant value of recycled material. Figure 12 illustrates the life cycle of products between different categories in the input-output system.

Figure 12. Material life cycle in an international production network



Source: van den Bergh and Janssen (2004).

While most kinds of these commodities are properly identified in BTDIxE, other types of used goods are difficult to differentiate; *e.g.* discarded PCs and second-hand transport equipment for re-use (such as aircraft) may be "recorded and classified under the appropriate commodity heading if their value is positive" (The United Nations, 1998). All used products that we managed to clearly identify (except antique arts and collection pieces) are listed in Annex Table 4.

4. DATA LIMITATIONS AND FUTURE DEVELOPMENTS

4.1 Asymmetries (re-exports adjustments)[24]

One of the major issues with merchandise trade statistics is reporting asymmetries, or the mirror statistics problem, whereby the value of exports from a country A to a country B (as reported by country A) may not match with the value of imports from country A to country B (as reported by country B).

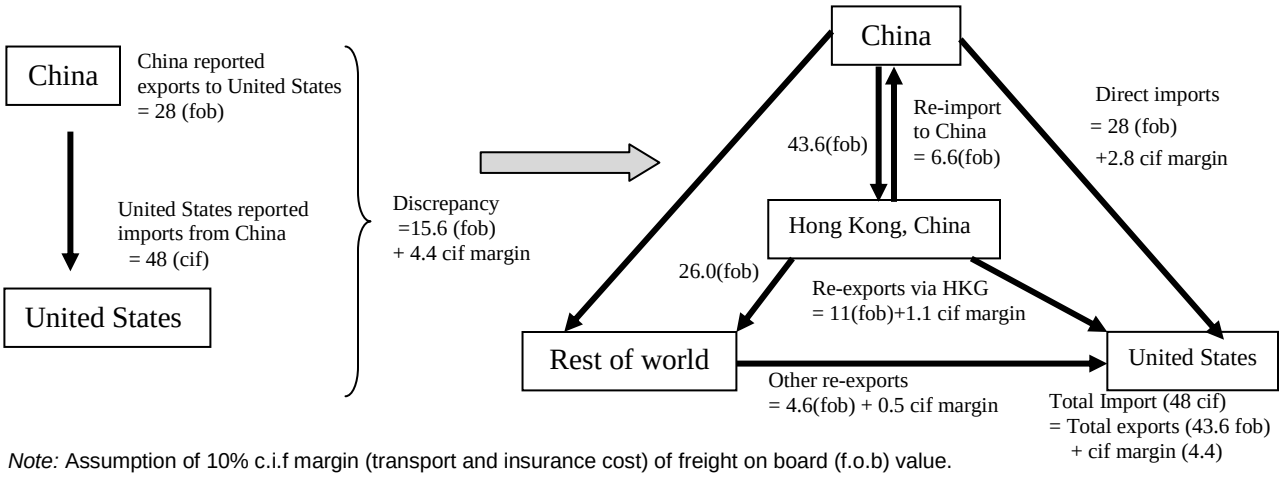
While this issue exists for almost all trade flows, the differences observed may be relatively small. In a few cases however, the discrepancy can be significant for some particular reporter-partner combinations.

For example, according to BTDIxE data, in 2005 China reported USD 28 billion exports of textile goods (BTDIxE industry *Textiles, Textile Products, Leather and Footwear*) to the United States, whilst for the same year United States reported USD 48 billion imports of textile goods from China, meaning a discrepancy of USD 20 billion (Figure 13).

Reasons for this discrepancy can vary. They can be due to statistical errors, different criteria used in the statistical offices (such as the recorded currency and the reporting threshold used), differences due to cost, insurance and freight (*c.i.f.*) valuation for imports versus freight on board (*f.o.b.*) valuation for exports, effects of merchanting, and can also stem from the re-export activities, one of the most important factors.

Re-exports occur when products enter a customs territory from one country and are shipped to another country without undergoing any transformation.[25] As such, re-exports are more likely to occur in countries and regions with favorable geographical position, in terms of intercontinental transportation, as well as competitive transportation and logistics costs. Using the example of above, China actually exported USD 28 billion textile products directly to United States in 2005 and USD 11 billion and USD 4.6 billion textile products were re-exported from Hong Kong, China and other re-export centres, respectively.

Figure 13. Adjustment using Hong Kong, China re-exports, billion USD, 2005



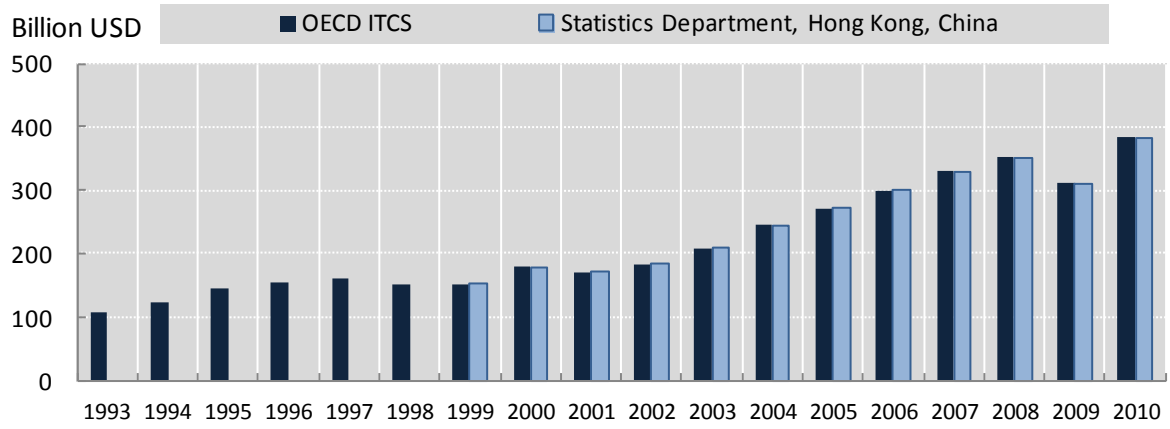
Note: Assumption of 10% c.i.f margin (transport and insurance cost) of freight on board (f.o.b) value.

Although the harmonised information of re-exports statistics across countries are generally not available, or not reported to Comtrade /ITCS, related data sources (such as National Accounts and import matrices of Input-Output Tables) indicate that the role of re-export and transhipment activities are significant in some countries with major maritime trading ports *e.g.* Hong Kong, China and Singapore in Asia, Belgium and the Netherlands in Europe. Unfortunately, the complete information of re-exports, *i.e.* the origin and destination countries by product, is not publicly available – although countries have been regularly requested to report their re-exports to UNSD and OECD.[26]

Over the last decade, much focus has been on the re-exporting activities of Hong Kong, China, due to the significant and increasing economic presence of mainland China as both importer and exporter. The Census and Statistics Department of the Hong Kong, China collects detailed re-exports by both originating country/territory and final destination, at the HS 6-digit level and from 1999 onwards. The re-exports database of Hong Kong, China is recorded in Hong Kong, China dollars (HKD) and can be converted into US dollars applying the appropriate market exchange rates of each year.

The re-exports of Hong Kong, China available in ITCS database are only given by destination but can nevertheless be compared with that provided by the Census and Statistics Department, for the common period 1999-2010. Comparisons were undertaken at the aggregate level, by destination and industry. The two sets of data are broadly consistent at the aggregate level (see Figure 14) nonetheless, some divergences occur when comparing them by destination, and that is even more true when looking at destinations crossed with industries. It turns out that less than 1.3% of Hong Kong, China observations are much smaller than ITCS re-exports, and those mainly relate to the *Non-ferrous Metals* industry; while a little more than 1.6% of Hong Kong, China re-exports are greater than that reported in ITCS, and those mainly concern the partner (destination) *Unspecified*.

Figure 14. Comparison of Hong Kong, China total re-exports



Sources: OECD, *International Trade by Commodity Statistics* (ITCS) and Statistics Department, Hong Kong, China, 2010.

4.2 Future developments

Continuing from the previous discussion, efforts have been made at the OECD to encourage National Statistical Offices to improve their reporting of merchandise trade statistics and to provide more information about their re-exports; this was, in particular, addressed at the Working Party on International Trade in Goods and Trade in Services Statistics in March 2014.

Future developments of BTDIxE database will mainly include a method for adjusting the bilateral trade flows presented in the database with re-exports. This method would make use of ITCS reported re-exports from Hong Kong, China and those provided by the Census and Statistics Department of the Hong Kong, China. Ideally, adjustments would also be made to account for re-exports from other major continental trading hubs, notably those located in Belgium, the Netherlands and Singapore.

Converting commodity-based statistics into industry and end-use data presents certain challenges. For example, personal computers and passenger cars can be both consumer and investment goods: Custom based merchandise trade statistics do not give information on final purchasers. As a result, it is difficult to identify whether a computer exported from country A to country B is eventually purchased by a household for final consumption or by an enterprise as investment.

Also, the identification of used and second-hand capital goods (such as transport equipment or second-hand aircrafts) from new capital goods would be an important achievement. Looking at 8-digit HS data for a certain number of reporters (like Japan, the US, EU countries, etc.), we have identified preliminary estimates for second-hand cars. Those data will be added to the database as soon as possible.

5. ACCESS TO BTDIxE

BTDIxE is made available in the form of multi-dimensional tables via OECD**.**Stat, the OECD's online data dissemination service which allows viewing, printing, graphing and exporting selections of data in a user-friendly manner.

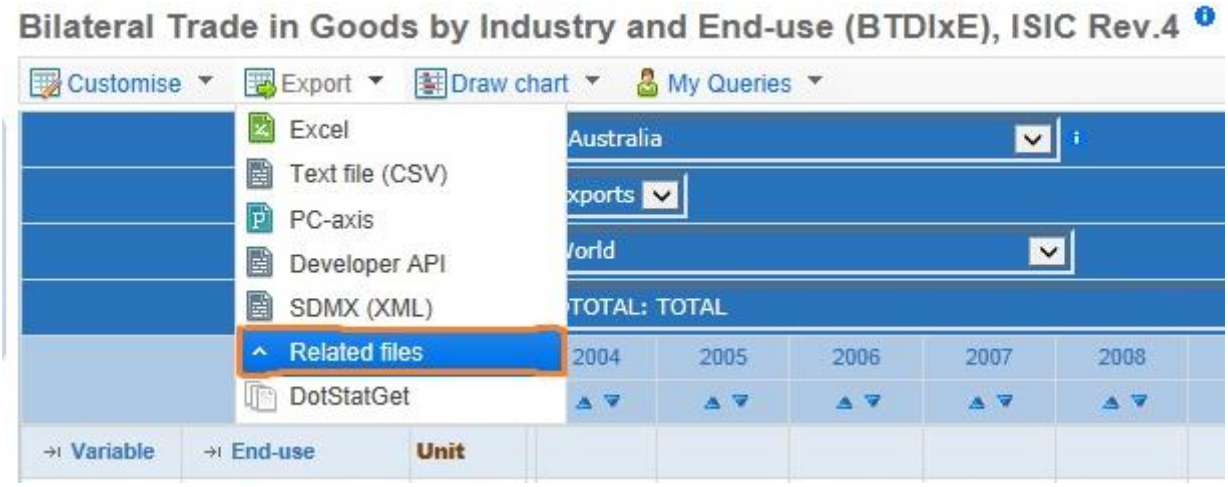
Direct access from here:

- ISIC Rev.3 ➔ http://stats.oecd.org/Index.aspx?DataSetCode=BTDIxE_i3
- ISIC Rev.4 ➔ http://stats.oecd.org/Index.aspx?DataSetCode=BTDIxE_i4

In OECD**.**Stat, BTDIxE default view presents exports and imports divided into end-use categories for one reporter, one partner, one industry and a selection of years. Trade flows are presented in two dimensions, i.e. as values expressed in USD thousands and as percentage shares by industry.

The OECD**.**Stat "Layout" option within the "Customise" menu enables to modify the default view by toggling the database's dimensions in rows and columns (see screen shot below). Various levels of metadata can be accessed by clicking on the little blue **i** which appears next to the dataset's title, or country names, etc.

Ready-made files are also available in the form of zipped text files (*.txt), having one zipped file per declaring country with the flows values (the shares by industry can be supplied on demand). Users can download BTDIxE country files from OECD**.**Stat by selecting the option 'Related files' from the 'Export' facility, in the top bar menu.



6. CONCLUSION

The **Bilateral Trade Database by Industry and End-use category** (BTDIxE) gathers substantial bilateral trade flows (exports and imports) of goods by industries and end-use categories. By dividing bilateral trade flows of products into industries and end-uses, we enable to go beyond the traditional analysis of the bilateral trade balances by industries and go further, looking at how industrial processes are fragmented across countries by product end-use categories and by activity sectors.

BTDIxE database is an important component of the OECD's Inter-Country Input-Output (ICIO) Tables from which Trade in Value Added (TiVA) indicators are derived, and it has proven to be a powerful tool used in a range of OECD key projects such as Global Value Chains (GVC) and Green Growth Indicators.

The particularities of BTDIxE database are, among other things, the use of multiple conversion keys to exploit trade data according to the reported version of HS; the treatment of confidential trade or missing values (*i.e.* the difference between the reported data at 2-digit in HS and the sum of their components at 6-digit are, where possible, allocated to industries and end-use categories); and the separation of certain products at 6-digit in HS that cannot be allocated to standard end-use categories (*i.e.* household consumption, capital and intermediate goods) into five additional categories: *Packed medicines*, *Personal computers*, *Passenger cars*, *Personal phones* and *Precious goods*.

Users are kindly invited to send comments, suggestions or to report any anomalies about BTDIxE database to stan.contact@oecd.org, mentioning BTDIxE in the title of the message.

NOTES

1. www.oecd.org/std/its/itcsinternationaltradebycommoditystatistics.htm.

2. http://unstats.un.org/unsd/COMTRADE/.

3. In general, source data are held according to Standard International Trade Classification (SITC) Rev.2 for the time period 1978-1987, the original version of HS (1988) for 1988-95, HS Rev. 1 (1996) for 1996-2001, HS Rev. 2 (2002) for 2002-06, HS Rev. 3 (2007) for 2007-11 and HS Rev. 4 (2012) from 2012 onwards. In the OECD ITCS database, international trade in goods are stored and published at the 5-digit level of SITC and the 6-digit level of HS, although some countries submit their data at the 8- or even 10-digit level.

4. Bosnia-Herzegovina, FYR Macedonia, Republic of Moldova, Montenegro and Serbia.

5. The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities or third party. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

6. *Footnote by Turkey*: The information in this document with reference to « Cyprus » relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognizes the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of United Nations, Turkey shall preserve its position concerning the "Cyprus issue". *Footnote by all the European Union Member States of the OECD and the European Union*: The Republic of Cyprus is recognized by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

7. Re-imports may be recorded when goods return after being exported for outward processing *i.e.* minor transformation (branding, packaging, repair), or return in an unaltered state (for example goods returned to the seller after cancellation of an order, art items returned after an exhibition held abroad, etc.). Similarly, re-exports are recorded when goods are exported after having been imported for inward processing; or are being returned in an unaltered state. Note that such data is prevalent for import data and only present for a few countries and often for only a few years. For most countries, exports (or imports) reported to OECD and UNSD implicitly include re-exports (or re-imports) although in BTDIxE (and indeed in ITCS and Comtrade) very few countries report them separately.

8. Data on 1988-1992 refer to the former Union Belgium, Luxembourg; data from 1993 refer to Belgium.

9. The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities or third party. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

10. The information in this document with reference to « Cyprus » relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the « Cyprus issue ».

11. See for example: http://unstats.un.org/unsd/trade/HS2007-BEC%20-%20Explanatory%20Note.pdf.

12. http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=2.

13. www.oecd.org/dataoecd/43/41/48350231.pdf.

14. http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27.

15. http://dx.doi.org/10.1787/5jlv73sqqp8r-en

16. HS 1988 is generally used for the time-period 1988-1995; HS Rev. 1 (1996) for 1996-2001; HS Rev. 2 (2002) for 2002-2006; HS Rev.3 (2007) for 2007-2011 and HS Rev.4 (2012) from 2012. Due to various reasons, not all custom offices have updated to the latest HS version for all time periods.

17. BTDIxE HS-ISIC Rev.4 correspondences were developed using the ISIC Rev.3.1–ISIC Rev.4 correspondence table available at http://unstats.un.org/unsd/cr/registry/regso.asp?Ci=60&Lg=1.

18. See http://unstats.un.org/unsd/cr/registry/regot.asp?Lg=1 and United Nations (2008), Correlation and Conversion table between HS 2007 and BEC: http://unstats.un.org/unsd/trade/HS2007-BEC%20-%20Explanatory%20Note.pdf.

19. Chinese Taipei is not officially recognised by the United Nations therefore trade figures are not explicitly compiled.

20. See page 9 of the HM Revenue and Customs Overseas Trade Statistics Methodology Paper: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/269872/GSSMethodspaper_v6.0.pdf.

21. At the end of 2006 the UK government implemented changes to VAT accounting rules ('reverse charge') for businesses trading in mobile telephones, computer chips and certain other goods.

22. www.cdsi.gov.sa/english/.

23. www.oecd-ilibrary.org/trade/data/international-trade-by-commodity-statistics_itcs-data-en.

24. For detailed discussion, see Guo *et al.* (2009).

25. http://unstats.un.org/unsd/tradekb/ExportPDF50128.aspx.

26. For example, at the annual meetings of OECD's Working Party on Trade in Goods and Services (WPTGS).

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ANNEXES

Annex 1: Data availability for a selection of BTDIxE countries / economies and per reported HS version

HS (default years)	HS1988 (1988-1995)		HS1996 (1996-2001)		HS2002 (2002-2006)		HS2007 (2007-2011)		HS2012 (2012-)
Reporters	yearmin	yearmax	yearmin	yearmax	yearmin	yearmax	yearmin	yearmax	yearmin
Albania	n.a.	n.a.	1996	2002	2003	2008	2009	2011	2012
Algeria	1992	1995	1996	2001	2002	2006	2007	2011	2012
Argentina	1993	1995	1996	2001	2002	2006	2007	2011	2012
Australia	1988	1995	1996	2001	2002	2006	2007	2011	2012
Austria	1995	1995	1996	2001	2002	2006	2007	2011	2012
Bangladesh	1989	2001	n.a.	n.a.	2002	2007	2008	2011	n.a.
Belarus	n.a.	n.a.	1998	2001	2002	2007	2008	2011	2012
Belgium	1993	1995	1996	2001	2002	2006	2007	2011	2012
Belgium, Luxembourg	1988	1992	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Bosnia & Herzegovina	n.a.	n.a.	n.a.	n.a.	2003	2007	2008	2011	2012
Brazil	1989	1996	1997	2001	2002	2006	2007	2011	2012
Brunei Darussalam	1992	2001	2002	2006	2007	2011	2012	2012	2013
Bulgaria	n.a.	n.a.	1996	2001	2002	2006	2007	2011	2012
Cambodia	n.a.	n.a.	2000	2003	2004	2006	2007	2012	2013
Canada	1988	1995	1996	2001	2002	2006	2007	2011	2012
Chile	1990	1996	1997	2001	2002	2006	2007	2011	2012
China	1992	1995	1996	2001	2002	2006	2007	2011	2012
Chinese Taipei	1990	1996	1997	2001	2002	2006	n.a.	n.a.	n.a.
Colombia	1991	1995	1996	2001	2002	2006	2007	2011	2012
Costa Rica	1994	1996	1997	2002	2003	2006	2007	2011	2012
Croatia	1992	1996	1997	2001	2002	2006	2007	2011	2012
Cyprus	1989	1995	1996	2001	2002	2006	2007	2011	2012
Czech Rep.	1993	1995	1996	2001	2002	2006	2007	2011	2012
Denmark	1988	1995	1996	2001	2002	2006	2007	2011	2012
Egypt	1994	2007	n.a.	n.a.	n.a.	n.a.	2008	2013	n.a.
Estonia	1995	1995	1996	2001	2002	2006	2007	2011	2012
Finland	1988	1995	1996	2001	2002	2006	2007	2011	2012
France	1988	1995	1996	2001	2002	2006	2007	2011	2012
Germany	1988	1995	1996	2001	2002	2006	2007	2011	2012
Greece	1988	1995	1996	2001	2002	2006	2007	2011	2012
Hong Kong, China	1992	1995	1996	2001	2002	2006	2007	2011	2012
Hungary	1992	1995	1996	2001	2002	2006	2007	2011	2012
Iceland	1988	1995	1996	2001	2002	2006	2007	2011	2012
India	1988	1995	1996	2002	2003	2008	2009	2012	2013
Indonesia	1989	1995	1996	2009	n.a.	n.a.	2010	2011	2012
Iran	n.a.	n.a.	1997	2002	2003	2010	2011	2011	n.a.
Ireland	1988	1995	1996	2001	2002	2006	2007	2011	2012

HS (default years)	HS1988 (1988-1995)		HS1996 (1996-2001)		HS2002 (2002-2006)		HS2007 (2007-2011)		HS2012 (2012-)
Reporters	yearmin	yearmax	yearmin	yearmax	yearmin	yearmax	yearmin	yearmax	yearmin
Israel	1995	1995	1996	2001	2002	2006	2007	2011	2012
Italy	1988	1995	1996	2001	2002	2006	2007	2011	2012
Japan	1988	1995	1996	2001	2002	2006	2007	2011	2012
Kazakhstan	1995	1997	1998	2003	2004	2008	2009	2011	2012
Korea	1994	1995	1996	2001	2002	2006	2007	2011	2012
Kuwait	n.a.	n.a.	2000	2005	2006	2009	n.a.	n.a.	2013
Latvia	1994	1996	1997	2001	2002	2006	2007	2011	2012
Lithuania	1994	1996	1997	2001	2002	2006	2007	2011	2012
Luxembourg	n.a.	n.a.	1999	2001	2002	2006	2007	2011	2012
FYR Macedonia	1994	1995	1996	2001	2002	2006	2007	2011	2012
Malaysia	1989	1996	1997	2001	2002	2008	2009	2012	2013
Malta	1994	1995	1996	2001	2002	2006	2007	2011	2012
Mexico	1990	1995	1996	2001	2002	2007	2008	2011	2012
Moldova	1994	1999	2000	2003	2004	2008	2009	2013	n.a.
Montenegro	n.a.	n.a.	n.a.	n.a.	2006	2007	2008	2011	2012
Morocco	1993	2001	n.a.	n.a.	2002	2013	n.a.	n.a.	n.a.
Netherlands	1988	1995	1996	2001	2002	2006	2007	2011	2012
New Zealand	1989	1995	1996	2001	2002	2006	2007	2011	2012
Nigeria	1996	1998	1999	2005	2006	2008	2009	2013	n.a.
Norway	1988	1995	1996	2001	2002	2006	2007	2011	2012
Oman	1989	1999	2000	2001	2002	2006	2007	2011	2012
Peru	1992	1997	1998	2001	2002	2007	2008	2011	2012
Philippines	1996	1999	2000	2006	2007	2013	n.a.	n.a.	n.a.
Poland	1992	1995	1996	2001	2002	2006	2007	2011	2012
Portugal	1988	1995	1996	2001	2002	2006	2007	2011	2012
Qatar	n.a.	n.a.	2000	2004	2005	2008	2009	2012	2013
Romania	1989	1996	1997	2001	2002	2006	2007	2011	2012
Russian Federation	1996	1996	1997	2001	2002	2006	2007	2011	2012
Saudi Arabia	1991	1998	1999	2001	2002	2006	2007	2011	2012
Serbia	n.a.	n.a.	n.a.	n.a.	2004	2006	2007	2011	2012
Serbia & Montenegro	1992	1999	2000	2004	n.a.	n.a.	n.a.	n.a.	n.a.
Singapore	1989	1996	1997	2001	2002	2006	2007	2011	2012
Slovakia	n.a.	n.a.	1997	2001	2002	2006	2007	2011	2012
Slovenia	1994	1995	1996	2001	2002	2006	2007	2011	2012
South Africa	n.a.	n.a.	2000	2001	2002	2006	2007	2011	2012
Spain	1988	1995	1996	2001	2002	2006	2007	2011	2012
Sweden	1988	1995	1996	2001	2002	2006	2007	2011	2012
Switzerland	1988	1995	1996	2001	2002	2006	2007	2011	2012
Thailand	1988	1998	1999	2001	2002	2006	2007	2011	2012
Tunisia	1991	1999	2000	2001	2002	2007	2008	2011	2012
Turkey	1989	1995	1996	2001	2002	2006	2007	2011	2012
Ukraine	1996	2000	2001	2007	2008	2010	2011	2013	n.a.
United Arab Emirates	1991	1998	1999	2002	2003	2007	2008	2011	n.a.
United Kingdom	1988	1995	1996	2001	2002	2006	2007	2011	2012
United States	1989	1995	1996	2001	2002	2006	2007	2011	2012
Venezuela	1994	1995	1996	2005	2006	2013	n.a.	n.a.	n.a.
Viet Nam	n.a.	n.a.	2000	2003	2004	2007	2008	2011	2012

n.a. not available.

Sources: OECD, *International Trade by Commodity Statistics* (ITCS) and United Nations, *Comtrade*.

Annex 2. When the reporter and the partner are the same, exports

Reporter = partner	Time-period	Average shares in the total World (%)	What does it cover? (ITCS metadata)
Albania	-	-	-
Argentina	-	-	-
Australia	2001-2003	negligible	-
Belgium-Luxembourg	1993-2010	2.1	Bilateral trade with Luxembourg. Goods in transit in Belgium coming from countries outside EU and bound for other Member States.
Bosnia-Herzegovina	-	-	-
Brazil	-	-	-
Bulgaria	-	-	-
Cambodia	-	-	-
Canada	2005-2005	-	-
China	-	-	-
Cyprus	-	-	-
Czech Republic	1993-2007	0.1	Exports to Czech Republic means for example exports to the bonded warehouse.
Spain	1989-1998	2.0	Trade with Spanish territories of Western Africa is not included.
Estonia	-	-	-
France	1988-1995	2.0	-
United Kingdom	-	-	-
Hong Kong, China	-	-	-
Indonesia	-	-	-
Ireland	2005-2010	0.6	-
Italy	1988-2006	negligible	-
Luxembourg	2008-2010	negligible	-
Mexico	1993-2000	negligible	Re-exports, where these refer to goods leaving the country for a limited period in order to be transformed, repaired or stored mainly in Inbound Export Industries (*Maquiladoras*).
Malaysia	-	-	-
New Zealand	-	-	-
Romania	-	-	-
Singapore	2006-2006	negligible	
Slovak Republic	1997-2009	negligible	Trade with Slovak Republic concerns re-imports or re-exports. Re-exports of goods, which were imported in the Slovak Republic for inward processing, for processing under customs control or for temporary use.
Slovenia	-	-	-
Thailand	-	-	-
Turkey	1994-2010	negligible	-
Chinese Taipei	1990-1999	negligible	-
South Africa	-	-	-

Annex 3. When the reporter and the partner are the same, imports

Reporter = partner	Time-period	Average shares in the total World (%)	What does it cover? (ITCS metadata)
Albania	2003-2010	negligible	
Argentina	2006-2009	0.1	
Australia	1998-2010	0.2	Trade with Australia concerns re-imports.
Belgium-Luxembourg	1993-2006	0.7	Bilateral trade with Luxembourg. Goods in transit in Belgium coming from countries outside EU and bound for other Member States.
Bosnia-Herzegovina	2003	0.1	-
Brazil	2000-2010	0.2	-
Bulgaria	2007-2009	0.1	-
Cambodia	2005-2009	negligible	-
Canada	1988-2010	1.4	Trade with Canada concerns the return of goods.
China	2000-2010	6.9	-
Cyprus	2000-2004	negligible	-
Czech Republic	1993-2008	0.5	Trade with Czech Republic concerns imports from custom-bonded warehouses or re-imports.
Spain	1988-1999	0.4	Trade with Spanish territories of Western Africa is not included.
Estonia	2000-2003	negligible	-
France	1988-2010	1.3	-
United Kingdom	2000-2010	1.1	-
Hong Kong, China	2009	0.2	-
Indonesia	2000-2010	0.5	-
Ireland	1993-2010	0.7	-
Italy	1988-2006	negligible	-
Luxembourg	2008-2010	0.8	-
Mexico	1996-2001	1.0	Re-imports, where these refer to goods entering the country for a limited period in order to be transformed, repaired or stored mainly in Inbound Export Industries (*Maquiladoras*).
Malaysia	2004-2010	0.7	-
New Zealand	2002-2010	0.4	Trade with New Zealand concerns re-imports.
Romania	2005-2006	0.2	-
Singapore	-	-	-
Slovak Republic	1997-2010	0.7	Trade with Slovak Republic concerns re-imports or re-exports. Re-imports of goods, which were exported abroad for outward processing or for return in unaltered state.
Slovenia	2004-2010	0.3	-
Thailand	2000-2010	1.3	-
Turkey	2006-2010	negligible	-
Chinese Taipei	1990-1999	0.1	-
South Africa	2002-2010	0.3	-

Annex 4. Used, recycled goods and wastes

End-use category: **Intermediate goods**						
BTDIxE industry:	HS1988	HS1996	HS2002	HS2007	HS2012	Product description
Waste			271091	271091	271091	Waste oil
			271099	271099	271099	
			382510	382510	382510	Municipal waste
			382520	382520	382520	Sewage sludge
			382530	382530	382530	Clinical waste
			382541	382541	382541	Halogenated waste
			382549	382549	382549	
			382550	382550	382550	Waste metals pickling liquors, hydraulic fluids, brake fluids and anti-freeze fluids
			382561	382561	382561	Waste mainly containing organic constituents
			382569	382569	382569	
			382590	382590	382590	Other waste
Chemical wastes	391510	391510	391510	391510	391510	Waste of polymers of Ethylene
	391520	391520	391520	391520	391520	Waste of polymers of Styrene
	391530	391530	391530	391530	391530	Waste of polymers of Vinyl chloride
Used rubber & plastics	391590	391590	391590	391590	391590	Waste of other plastics
	400400	400400	400400	400400	400400	Rubber waste and scrap
	401220	401220	401220	401220	401220	Used pneumatic
Waste leather	411000	411000	411520	411520	411520	Waste leather
Recovered paper	4707xx	4707xx	4707xx	4707xx	4707xx	Recovered paper or paperboard
Worn textiles	630900	630900	630900	630900	630900	Worn clothing and other worn articles
	631090	631090	631090	631090	631090	Used rags, rope, etc.
Non-ferrous scrap metals	7112xx	7112xx	7112xx	7112xx	7112xx	Precious metal ash
	740400	740400	740400	740400	740400	Non-ferrous scrap and waste
	750300	750300	750300	750300	750300	
	760200	760200	760200	760200	760200	
	780200	780200	780200	780200	780200	
	790200	790200	790200	790200	790200	
	800200	800200	800200	800200	800200	
		854810	854810	854810	854810	Used batteries
Ferrous scrap metals	7204xx	7204xx	7204xx	7204xx	7204xx	Ferrous scrap and waste
	890800	890800	890800	890800	890800	Vessels for breaking up

Annex 5. Examples of % differences between HS2007 and HS2002 2-digit chapter data, exports in 2009

	Austria	Estonia	France	Germany	Hungary	Italy	Poland	Portugal	Russian Federation	United Kingdom	United States
01	0	-5	0	-15	-3	-10	-2	-49	0	0	0
02	0	-8	0	-5	-5	-2	-2	-15	0	0	0
03	0	-12	0	-14	-5	-5	-1	-15	0	0	0
04	0	-3	0	-3	-4	-2	-1	-1	0	0	0
05	0	-1	0	-9	-13	-3	-3	-12	0	0	0
06	0	-18	0	-17	-6	-4	-9	**-52**	0	0	0
07	0	-3	0	-18	-4	-4	-5	-15	0	0	0
08	0	-10	0	-13	-5	-2	-3	-16	0	0	0
09	0	-3	0	-4	-4	-3	-1	-19	0	0	0
10	0	-2	0	-6	-4	-3	-1	-15	0	0	0
11	-39	-4	-8	-6	-3	-4	-3	-1	0	0	0
12	0	-3	0	-9	-7	-4	-2	-3	0	0	0
13	0	-7	**-54**	-4	-2	-1	-3	0	0	0	0
14	0	-4	0	-30	-4	-2	-19	-43	0	0	0
15	0	-4	0	-5	-4	-2	-1	-5	0	0	0
16	0	-4	0	-9	-4	-2	-2	-5	0	0	0
17	-18	-13	-28	-5	-5	-1	-3	-2	0	0	0
18	0	-1	0	-3	-5	-1	-6	-11	0	0	0
19	0	-4	0	-5	-4	-2	-2	-4	0	0	0
20	-7	-7	0	-6	-4	-2	-2	0	0	0	0
21	0	-3	-10	-4	-4	-2	-1	-1	0	0	0
22	0	-4	0	-6	-4	-2	-1	-3	0	0	0
23	0	-1	0	-5	-4	-2	-11	-10	0	0	0
24	0	-2	0	-1	**-79**	0	0	0	0	0	0
25	-3	-1	-14	-11	-18	-2	-5	-7	0	-3	0
26	0	0	0	-9	**-72**	-2	-2	0	0	0	0
27	-1	-2	0	-10	-4	-6	0	0	0	-1	0
28	**-54**	-1	-18	-3	-9	-2	-1	-13	0	**-66**	0
29	-31	-1	-36	-2	-24	0	-1	-5	0	-7	0
30	-1	-14	0	-2	-8	0	-3	-2	0	-1	0
31	**-88**	-2	-6	-2	-5	-2	-3	0	0	**-59**	0
32	-1	-2	-2	-5	-5	-2	-2	-9	0	0	0
33	0	-15	0	-3	-3	-2	-1	-7	0	0	0
34	0	-7	0	-5	-3	-2	-1	-8	0	0	0
35	-31	-5	0	-3	-10	-2	-2	-33	0	-8	0
36	**-60**	-2	-31	-11	-45	-2	-3	-10	0	**-73**	0
37	0	-1	0	-5	-19	-1	-7	-33	0	0	0
38	-10	-3	-1	-4	-5	-1	-2	-7	0	-1	0
39	-4	-4	-7	-5	0	-2	-2	-4	0	-1	1
40	-3	-3	-5	-4	-4	-1	-1	-2	0	-11	0
41	0	-7	0	-18	-5	-2	-4	-13	0	0	0
42	0	-17	0	-10	-5	-1	-5	-21	0	0	0
43	0	0	0	-27	**-87**	-2	-3	0	0	0	0
44	0	-7	0	-11	-8	-4	-5	-8	0	0	0
45	0	-6	0	-22	-20	-1	-7	-7	0	0	0
46	0	-28	0	-15	-3	0	-14	-1	0	0	0
47	0	-2	0	-9	-4	-2	-3	-6	0	0	0
48	-10	-7	-4	-4	-3	-1	-2	-18	0	0	0
49	0	-14	0	-10	-4	-1	-2	-24	0	-11	0
50	0	-22	0	-14	-25	-2	-13	**-74**	0	0	0
51	0	-1	0	-9	-10	-1	-5	-9	0	0	0
52	0	-3	0	-16	-26	-1	-8	-27	0	0	0
53	0	-11	-11	-15	-11	-2	-7	-13	0	0	0
54	-11	-5	0	-11	-28	-1	-3	-6	0	-29	0
55	**-75**	-5	-9	-12	-36	-2	-10	-5	0	-27	0
56	0	-3	0	-7	-5	-1	-4	-16	0	0	0
57	0	-4	0	-15	-16	-1	-3	-13	0	0	0
58	0	-5	0	-19	-2	-3	-5	-6	0	0	0
59	-6	-4	0	-9	-2	-2	-2	-5	0	0	0
60	0	-5	0	-15	-7	-2	-5	-10	0	0	0
61	0	-5	0	-6	-4	-2	-3	-10	0	0	0
62	0	-6	0	-6	-5	-1	-4	-11	0	0	0
63	0	-5	0	-14	-4	-3	-3	-6	0	0	0
64	0	-10	0	-6	-5	-2	-4	-8	0	0	0
65	0	-4	0	-10	-28	-3	-6	-4	0	0	0

Annex 5. (continued)

	Austria	Estonia	France	Germany	Hungary	Italy	Poland	Portugal	Russian Federation	United Kingdom	United States
66	0	**-67**	0	-7	-15	-4	-2	-1	0	0	0
67	0	-5	0	-21	-2	0	-17	-29	0	0	0
68	0	-13	0	-10	-4	-2	-3	-21	0	0	0
69	0	-6	0	-8	-4	-1	-1	-6	0	0	0
70	-33	-3	0	-6	-4	-1	-2	-3	0	-1	0
71	0	-5	0	-4	-40	-1	-1	-2	**-71**	0	0
72	-3	-4	-1	-4	-10	-1	-2	-1	0	0	0
73	0	-8	-14	-10	-7	-1	-4	-14	0	0	0
74	0	-5	-1	-4	-5	-1	-1	-6	0	-2	0
75	0	0	0	-5	-3	-1	-1	0	0	0	0
76	0	-6	0	-6	-8	-2	-2	-3	0	0	0
78	0	0	0	-3	-22	0	-1	-1	0	-7	0
79	-1	-6	-47	-10	-9	-2	-1	-4	0	-1	0
80	0	0	0	-10	-3	-3	-1	-5	0	0	0
81	**-52**	-1	**-56**	-9	**-90**	-2	-8	0	0	-1	0
82	-1	-6	0	-12	-5	-3	-1	-9	0	0	0
83	0	-14	0	-7	-4	-2	-3	-8	0	0	0
84	0	-6	0	-6	-4	-1	0	-6	0	0	1
85	-1	-3	-1	-6	-5	-2	-1	-5	0	-2	-1
86	-2	-2	0	-3	-6	-5	-2	-2	0	0	0
87	-1	-4	0	-6	-6	-1	0	-1	-31	-3	0
88	0	0	0	-8	**-69**	0	-1	0		**-100**	**-90**
89	0	-3	0	-2	-13	-1	-1	-3	0	-1	0
90	-6	-4	0	-4	-17	-1	-2	-10	0	0	0
91	0	-13	0	-6	-12	-1	-3	-8	-9	0	0
92	-36	0	0	-17	-7	-4	-7	-18	0	0	0
93	**-87**	0	0	-8	**-98**	-1	-1	-1	**-92**	**-79**	0
94	0	-7	0	-10	-4	-2	-2	-11	0	0	0
95	-1	-5	0	-5	-10	-2	-9	-29	0	0	0
96	0	-5	0	-10	-6	-2	-6	-12	0	0	0
97	0	-1	0	-11	-1	-1	-5	**-74**	0	0	0
Sum-of-2digit	-4	-4	-2	-6	-6	-2	-2	-7	-1	-6	-7
99	18423	1417	172271	339	3049	142	4664	1398	15	850	243
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**