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Export market shares – a trivial concept?

Klaus Vondra[1]

Abstract

The European Commission and euro area central banks use different methods to calculate export market shares and rely on different data sources to do so. Thus, the resulting evidence varies considerably over time, prompting different economic policy conclusions with respect to the development of export competitiveness – which is an undesirable fact. This paper presents methods and data sources used to derive export market shares with a view to explaining these differences. We conclude that the export market share concept is trivial only at a first glance because it can be implemented in a number of ways none of which would appear to be the single best practice.

Keywords: Export market shares, conceptual and data differences

JEL: F14, F40, H12

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Many thanks to Beate Resch for helping to set up the data base as well as Christian Ragacs, Ingeborg Schuch and Walpurga Köhler-Töglhofer for substantive comments.

Export market shares – a trivial concept?

Klaus Vondra[1]

The European Commission and euro area central banks use different methods to calculate export market shares and rely on different data sources to do so. Thus, the resulting evidence varies considerably over time, prompting different economic policy conclusions with respect to the development of export competitiveness – which is an undesirable fact. This paper presents methods and data sources used to derive export market shares with a view to explaining these differences. We conclude that the export market share concept is trivial only at a first glance because it can be implemented in a number of ways none of which would appear to be the single best practice.

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Following the European debt crisis, the European Commission (EC) moved to implement the Macroeconomic Imbalance Procedure (MIP)[2] within the framework of the so-called European Semester[3]. MIP analysis is based on a scoreboard of 14 indicators focusing on competitiveness developments, one of them being the change in export market shares. In addition, export market shares are being monitored closely by the national central banks as well as the OECD, the IMF, rating agencies and other economic institutions. In the academic discussion, market share developments are at the heart of several work streams, especially within the literature on international competitiveness.

However, there is no unique definition of export market shares and no unique way of calculating them. Every institution uses its own method, and different data sources on top of that. This means that the market share developments identified and the

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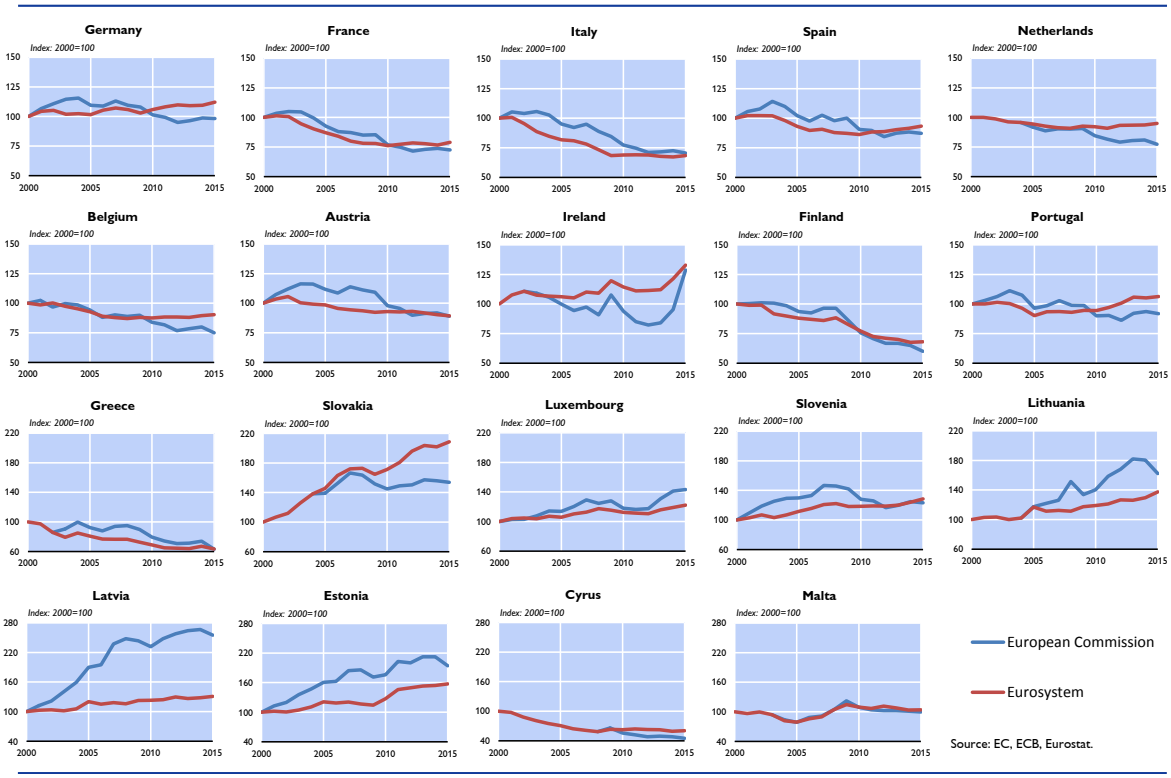
[2] See: https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/eu-economic-governance-monitoring-prevention-correction/macroeconomic-imbalance-procedure_en
[3] See: https://ec.europa.eu/info/strategy/european-semester_en

economic policy proposals put forth as a result of those exercises differ as well. In Austria, for example, the EC found two Scoreboard indicators to be constantly out of target within the European Semester 2015: the general government deficit and export market shares (European Commission, 2015, p. 110). This finding triggered an in-depth review of Austria in early 2016, during which EC experts were quick to share the opinion of the Austrian central bank that the undershooting essentially reflected the specific calculation method, and that Austria's export market shares were actually not significantly off track. In its final report, the Commission thus concluded that there were no major imbalances in Austria with regard to its external competitiveness position (European Commission, 2016).

Austria is not the only country where the market share measures derived by the European Commission differ considerably from those calculated by the central bank. While the EC measures are available through Eurostat, the corresponding central bank analyses are not necessarily publically available, but they can be computed easily by central bank staff experts, and they can also be reproduced by non-central bank experts, as the underlying methods are published.

Figure 1: Market share development for nineteen euro area countries



Looking at the results for the market shares derived by the European Commission[4] and those derived using the central banks' methods (see Figure 1), we identify the following key differences: In 14 out of 19 countries, gains of market shares calculated with the EC method trailed the gains derived with the central banks' methods. In a couple of countries (DE, NL, BE, PT, LU, CY), the calculations yielded rather similar market share developments until 2010/2011 but divergent developments thereafter – whereas the pattern was reversed for other countries (IT, ES, AT, SI). In the extreme case, the market share gains evidenced by one method contrasted losses identified with the other method (DE, PT, MT).

The differences between the market share developments identified by the EC and the euro area central banks reflect the use of different definitions of market shares, different calculation methods and different data sources. Given these differences, it is not possible to derive market shares following the EC definition with the data used by central banks, and vice versa. Therefore this paper uses two other data sources which make it possible to calculate market shares with both definitions. In such a way we can break down the differences shown in Figure 1 into methodical and data differences.

To sum it up, the aim of this paper is to take a deeper look at the definition of market shares and the data sources used to derive them. By presenting the formal differences as well as details on the data definitions and collection procedures we list pros and cons of the several dimensions analyzed, both from a theoretical and an empirical point of view. In the empirical part we present market share calculations for all euro area countries based on several calculation methods and different data sources.

The paper is structured as follows: In Section 1 the paper explains different ways to derive market shares before Section 2 discusses data issues. Section 3 presents the empirical results. The paper concludes with a summary in Section 4.

[4] For NL, IE, GR, SK, LT, CY and MT the calculations start later than 2000. For these countries the index starts on the index-point of the central bank method.

1 Methods

Domestic exports divided by world exports at time t equal the export market share of a country. The key interest is not so much on the export market share as such but on its development over time. Technically, changes in market shares can basically be derived in two different ways, either as the change in the market share itself (which can either be expressed in percentage points or as a percent change) or – by way of approximation – as the change of export/import growth rates. Appendix A illustrates the calculations for the methods presented here based on an exercise for five countries.

Mathematically, the change in market shares (MS) can be defined in a number of ways:

(1) The change in market shares equals the absolute difference between successive measures of the export share of world exports, i.e.

$$MS(1) = x_2^{i,W} - x_1^{i,W}; x_t^{i,W} = \frac{X_t^i}{X_t^W},$$

with X^i_t being total exports of country *i* in time *t* and X^W_t being total world exports in period *t*. x^i_t is given in percent, therefore the difference is measured in percentage points. This method is hardly ever used in the literature.

(2) The change in market shares equals the percent difference between successive measures of the export share of world exports, i.e.

$$MS(2) = \frac{d\left(x^{i,W}\right)}{x^{i,W}} = \frac{x_2^{i,W} - x_1^{i,W}}{x_1^{i,W}};$$ *d* indicating the difference to a specific variable over time. The method is used for example by Bennett et al. 2008 (p. 9) in an IMF working paper.

(3) The change in market shares approximately equals the percent difference between successive measures of the export growth of country *i* and world export growth, i.e.

$$MS(3) = \frac{d\left(x^{i,W}\right)}{x^{i,W}} \cong \frac{d\left(X^i\right)}{X^i} - \frac{d\left(X^W\right)}{X^W}$$

with X^i being total exports from country *i* and X^W being world exports. Methods MS(2) and MS(3) are only approximately identical. See Appendix B for the recalculation.

The European Commission method is based on this definition.[5] In order to smooth out short-run fluctuations, the Scoreboard lists the 5-year change (in percent). The year-to-year change is part of the auxiliary indicators. In the years after the great recession, the Scoreboard indicator was distorted by the strong shift in 2010, therefore the year-to-year change was more appropriate for analyses until 2015. The European Commission computes the market shares via volume data for goods and services (European Commission 2015, p.77), thus correcting for relative price changes and IMF balance of payment data for world exports.

(4) Calculation method (3) can be extended by comparing the difference between the export growth of country *i* and the weighted import growth of its respective trading partners, i.e.

$$MS(4) = \frac{d\left(X^i\right)}{X^i} - \sum_j w_{ij} \frac{d\left(IM^j\right)}{IM^j};$$

with $\frac{d\left(IM^j\right)}{IM^j}$ being the import growth of trading partner *j* and w_{ij} being the share of exports from country *i* to country *j* to total exports from country *i*.

This definition is used by the ECB and the euro area national central banks, see Hubrich and Karlsson 2010, p. 10. The ECB relies on a weighting matrix which only accounts for goods exports. The single weights between countries are a moving average of the past three years. Measures calculated with a weighting matrix based on three-year-moving-average trade links will differ only slightly from measures using trade links of the previous year only, keeping everything else unchanged, as the results predominantly depend on import growth. Therefore and for simplicity, the weights used in this paper are based only on the previous year's trade links. The export and import data are national accounts data, and the weighting matrices are based on Eurostat Comext data.

[5] For details see: http://ec.europa.eu/eurostat/cache/metadata/DE/tipsex_esms.htm

From a methodical view both export (from country *i* to country *j*) and import data (imports in country *j* from country *i*) can be used to derive market shares for country *i* for methods MS(1), (2) and (3). To produce consistent results, the bilateral export data would need to be identical with the respective bilateral import data. If the data were identical, export data would mirror import data. However, as shown Section 2 this is rarely the case. This notwithstanding, many studies assume that they are identical, i.e. publications of the European Commission (EC, 2012, p.32), the IMF (IMF, 2011, p.8) or the German Federal Statistical Office (Statistisches Bundesamt, 2012, p. 338). However, this also means that the resulting market shares are not correct.

2 Data

The methodical differences apart, the two institutions also use different data sources. Based on the underlying data, it is not possible to implement the central banks' market share concept with the EC data base (there are no bilateral trade data available in the national accounts, which are needed for the weighting matrices), nor is it possible to implement the EC market share concept with the central banks' data base (world exports are not available within national accounts data for individual countries). Therefore it is not possible to evaluate the methods by simply implementing one method with both data sources. To evaluate the methodical difference we will use two additional data sources: OECD TiVA[6] and UN Comtrade data. Both data sources provide bilateral trade data for both exports and imports, hence weighing matrices can be constructed and world aggregates are available.

Before proceeding with this task we will discuss these data sources.

National accounts, used by the EC and central banks

Exports and imports in the national accounts, following the rules of ESA 2010 (Europäische Union 2014), are compiled from foreign trade statistics (FTS). , subject to the definitions of exports and imports are described in paragraphs 3.158 – 3.179 (Eurostat 2013). There are some conceptual differences with the foreign trade statistics, with respect to survey methods, time of recording and valuation. One key difference between the foreign trade statistics and the national accounts is given by the coverage definition: While the foreign trade statistics reflect the "movement of

[6] TiVA: Trade in value added

goods", the national accounts and BoP data reflect "change of ownership". The national accounts data rely on the general trade system principle[7]. The valuation of exports and imports in the national accounts follows the FOB[8] concept. Basically, national accounts data are available both in nominal and real terms, are denominated in the currency of the respective country, and they include both goods and services, but no bilateral trade.

UN Comtrade[9] / EU Comext[10], mainly used for sectoral analysis

UN Comtrade is the world's largest database of trade statistics, compiled by the United Nations Statistics Division (UNSD). The EU Comext database is hosted by Eurostat. These two data bases are conceptually based on the concepts of foreign trade statistics. They comprise nominal goods trade data on a disaggregated (HS and SITC classification) bilateral base. Comtrade data are available for almost all countries in the world and are denominated in USD; Comext data are available only for EU countries (as reporters) and are denominated in EUR.

Trade flows are recorded on the basis of four general rules (United Nations, 2011, p. 8):

1. All goods which add to or subtract from the stock of material resources of a country by entering (imports) or leaving (exports) its economic territory are recorded.
2. Trade below customs and statistical thresholds are estimated and included if economically significant.
3. Change of ownership: Record transaction associated with the physical movement of goods across borders.
4. Time of recording: As a general guideline, record goods at the time when they enter or leave the economic territory of a country.

The guidelines for the recording process are very comprehensive; nevertheless detailed principles are important to know:

[7] Under the general trade system, the statistical territory includes customs warehouses, all types of free zones, free circulation areas and premises for inward processing. For details see IMF, 2014, p. 76-78.

[8] FOB / CIF adjustment: The terms FOB (Free on board) and CIF (Cost, Insurance and Freight) come from the definitions of the terms of delivery for international trade. They are part of a broader class of delivery terms, the so called "Inco Terms", defined by the International chamber of commerce (EC 2004, p. 6)

[9] http://comtrade.un.org/

[10] http://ec.europa.eu/eurostat/data/database#

(1) Based on the 2010 guidelines, Comtrade uses the general trade system to compile both import and export statistics. If countries follow the *special trade system*,[11] their data should be aligned with the *general trade system*. National accounts data are also based on the general trade system (see DESTATIS 2015). In contrast, conventional trade statistics in Europe (extra-EU trade in Comtrade, see Eurostat 2015, p.13) still rely on the special trade system.

(2) Foreign trade statistics (FTS) (Comext and Comtrade) use different conceptual frameworks for treating exports and imports: (1) Imports are recorded by the country of origin while exports are recorded by the country of the last known destination (different *partner country concept*). (2) Export data are recorded on FOB basis, i.e. "free on board" and imports are recorded CIF, i.e. "cost, insurance and freight" and include shipping and especially insurance costs (different *valuation principle*). Consequently within FTS data, bilateral export flows do not mirror bilateral import flows.

(3) Further differences are (a) interpretation and application of the commodity classification; (b) partner country attribution (i.e., in the case of indirect trade or triangular trade); (c) confidentiality; and (d) other sources of discrepancy (United Nations, 2013, p.109).

Reconciliation studies correct for these differences. As some differences are not purely statistical "errors" (i.e. missing data) but based upon different concepts these studies need to generate new data series. One example for such a correction is the BACI database[12]. Based on the Comtrade database the French research center for international economy (CEPII) corrects for the differences described above and provides highly disaggregated mirror data (for HS 6-digit) for more than 200 countries on a yearly basis since 1995.

IMF balance of payments[13], used by the EC for global exports

While foreign trade statistics provide very detailed trade data on goods, balance of payment statistics (BoP statistics, IMF (2009)) also include service data and data on investments and financial assets. Data are nominal in USD, partly in EUR. The BoP data are available on an aggregate basis only. Due to (1) the principle of coverage

[11] The stricter definition of the special trade system excludes customs warehouses, all types of free zones and premises for inward processing are from the statistical territory by; thus only imports and exports of the free circulation area are recorded. For details see IMF, 2014, p. 76-78.
[12] See: http://www.cepii.fr/CEPII/en/publications/publicat.asp
[13] http://data.imf.org/?sk=7A51304B-6426-40C0-83DD-CA473CA1FD52

and time of recording[14] and (2) the valuation principle, BoP data differ from FTS data (see EC 2004). These methodical differences explain why the two data sources will yield different bilateral export growth figures. For example, while Statistics Austria (FTS compilation) recorded +10.2% and +16.7% growth for goods exports from Austria to the U.S.A. in 2014 and 2015, the corresponding BoP-derived measures (source: OeNB) were +5.3% and -2.7%.

OECD trade in value added (TiVA)[15], mainly used by academics within value-added studies

In a joint initiative the OECD and the WTO have developed a database of trade in value-added. This database is based on UN International Standard Industrial Classification (ISIC), hence it is compatible with other industry-based analytical datasets (OECD – WTO (1), p. 16). Based on national input-output tables, which are derived from national accounts and trade statistics, the international input-output tables are also corrected for the inconsistency issues of foreign trade statistics. CIF-priced import figures are converted to FOB export figures (OECD – WTO (1), p. 13) and different countries' treatment of re-exports and transit trade are eliminated. As a result bilateral gross exports in the TiVA match the bilateral import figures. Total exports and imports are consistent with national account data, but bilateral trade figures differ from official statistics (OECD-WTO (2), p.3-4). TiVA gross export and import data include both goods and services and are denominated in nominal USD. The big drawback is time coverage; data are only available until 2011.

Summing up the different data sources covered, Table 1 gives an overview of the key characteristics:

[14] "The BPM6 stresses that the basis for the balance of payments compilation should be the change of ownership rather than the general trade system (…) or the special trade system (…). (IMF 2014, p. 77, 5.16).

[15] https://stats.oecd.org/index.aspx?queryid=66237

Table 1: Line-up of data sources and their characteristics

Data source	National accounts/ Balance of payments European Commission	National accounts Central banks	Comtrade/Comext (Foreign trade statistics)	OECD TiVA
Coverage	goods and services	goods and services	goods	Goods and services
Exports/imports	bilateral trade flows not available	bilateral trade flows not available	bilateral flows, but no mirror data	bilateral flow, mirror data
Prices	real	real	nominal	nominal
Structural break	not known	1995	2005/2006	only until 2011
Coverage definition	Change of ownership		Movement of goods	-
	-	General trade system	Comtrade: General TS Comext: Special TS	-
	Adjusted FOB/CIF	FOB	FOB / CIF	FOB

TS … trade system

The goal of this paper is to calculate market shares with the methods of both the European Commission and the European central banks but using the same data base for both methods. For robustness reasons we use two data sources with six different specifications. Subsequently we discuss the properties of the data used.

1. **TiVA data** are available in two definitions: (1) total exports (gross terms) and (2) the domestically valued-added content of exports (DVA). The data sets comprise nominal goods and services for the years 1995, 2000, 2005, 2008 to 2011[16]. Unlike Comtrade data, TiVA data are only available for OECD members and some additional countries but not for all countries in the world. Therefore we select the set of countries for this study on the basis of availability within TiVA – comprising data for 55 countries[17]. The raw data include a world aggregate, hence deriving a "rest of the world" (ROW) region, accounting for all countries which are not explicitly considered, is straightforward.
2. **Comtrade** data[18] are presented in four different specifications: On the one hand we compare exports from country i with world exports (excluding those from country i). On the other hand we compare imports stemming from country *i* with world imports (again excluding imports from country i). These two settings are first calculated vis-à-vis the other 54 selected countries, ignoring the remaining countries. In a second step a "Rest of the world" (ROW) aggregate is constructed in such a way that world imports are identical with

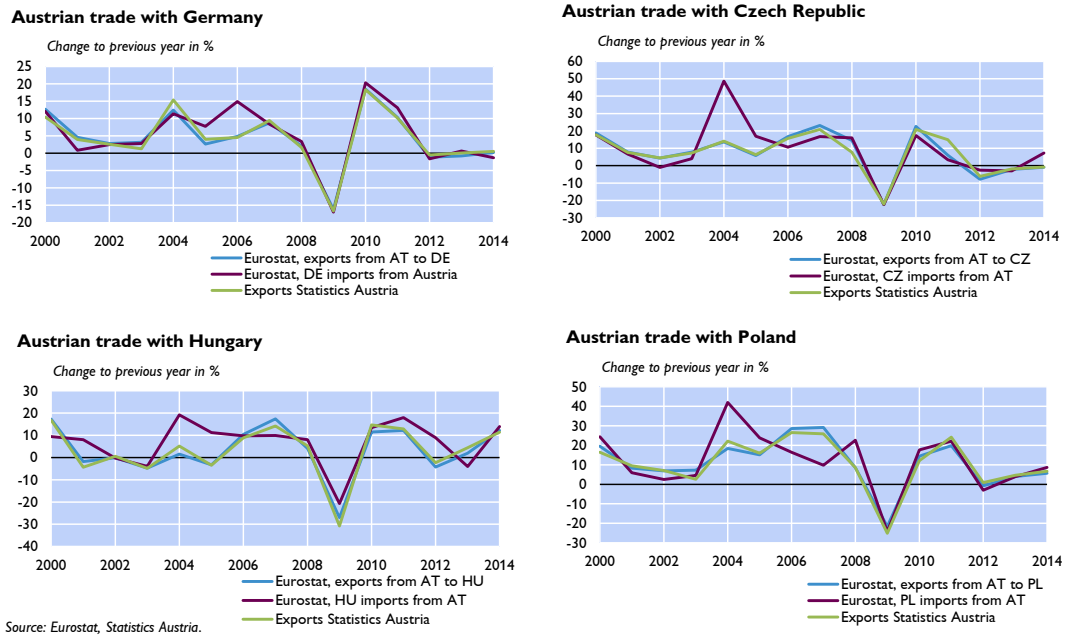
[16] As data are presented from 2006 onwards, the change between 2006 and 2008 is a linear interpolation from the change between 2005 and 2008.
[17] Countries considered: EU-28; Switzerland, Norway, Canada, USA, Mexico; Brazil, Argentina, Chile, Columbia; China, Hong Kong, India, Indonesia, Japan, Korea, Malaysia, Philippines, Russia, Singapore, Thailand; Australia, New Zealand; Israel, Saudi Arabia, Turkey; South Africa, Tunesia.
[18] Export data for Austria 2015 are extrapolated with export growth numbers from Statistics Austria.

world exports.[19] Once again, data are available in nominal terms, denominated in USD and available since 1995. We show developments since 2000 to be comparable with market share developments derived via the EC and the central banks' methods as shown in Figure 1.

It should be stressed that there is a widely unknown data break in foreign trade statistics data in the years 2004-2006, when European countries stopped publishing "*Repair business*" data in intra-EU trade (in 2005) and in extra-EU trade (in 2006)[20]. The resulting break is evident from a comparison of bilateral export and import data, which, while not identical by definition, should at least develop similarly in growth terms over time. However, since different statistical agencies implemented the repair-business regulation at different points in time, we have a significant overestimation of import growth in several bilateral country cases in the years 2004 to 2006. This data break is shown in Figure 2 for bilateral exports from Austria to Germany, Czech Republic, Hungary and Poland.

Figure 2

Data break of bilateral trade data due to reclassification of repair business



Source: Eurostat, Statistics Austria.

[19] Consider a table with bilateral trade data (in year t). Export levels from country *i* to all selected countries are listed in a row. Subtracting the sum of these exports from world exports of country *i* yields the rest of the world (ROW) aggregate. The same can be done on the import side with a sum over the columns. The ROW import numbers can be used to complete the export matrix as additional row, the ROW export numbers can be used to complete the import matrix as additional column.

[20] This change in the mythology goes back to VO 1982/2004 and VO 1949/2005, see Seiringer (2006)

Eurostat export data from Austria to the four countries are compared to Eurostat import data from the four countries. In addition we add a second data source for comparison reasons, namely bilateral export data from Statistics Austria. As expected, import growth clearly exceeded export growth in 2004 (CZ and PL), 2004/2005 (HU) and 2005/2006 (DE). This break has to be taken into account when working with Comtrade or Comext data. Thus we discuss detailed results only from 2006 onwards.

Next to the classification problem of repair businesses, Comtrade data offer some distinct differences from the data used by the EC and central banks. These differences are summarized in Table 1. First, unlike the national accounts and BoP data used by the EC and central banks, Comtrade data are in nominal terms. Hence results for countries with a high export deflator (e.g. Latvia with an annual export deflator of 4.2% or Slovakia, with 3.6%) are difficult to compare. Second, unlike national accounts/BoP data, Comtrade data cover only goods exports. As the export partners for services will presumably differ from the export partners for goods, the results for countries like Luxembourg or Cyprus (where goods exports account for less than 30% of total exports) need to be interpreted with caution. Third, we consider a sample of 55 countries in total, with the sample covering almost all exports/imports for all euro area countries. For Germany, the Netherlands, Belgium, Austria, Ireland, Slovakia or Luxembourg, the 54 partner countries account for more than 90% of their total exports. However, this is not true for Cyprus and Malta (where there are years with exports to the 54 countries with a coverage of less than 60 % of total exports), hence for these countries the results must be taken with caution.

Table 1: Characteristics of export data for euro area countries

in %	Average yearly growth rate of export deflator	Share of goods exports to total exports		Share of exports to the 54 covered countries to total exports		Share of imports to the 54 covered countries to total imports	
		min	max	min	max	min	max
Germany	0,4	82,8	86,3	92,7	95,4	91,4	95,4
France	0,5	72,0	77,8	84,2	91,1	84,3	92,1
Italy	1,3	79,8	82,3	86,5	90,9	80,4	88,0
Spain	1,4	67,0	71,2	83,9	90,7	80,7	90,3
Netherlands	0,7	76,6	81,0	91,3	95,3	90,5	93,3
Belgium	0,9	70,9	80,2	91,8	96,1	94,1	95,9
Austria	1,0	70,0	73,9	91,9	96,7	89,6	96,8
Ireland	0,8	51,6	78,2	96,1	97,7	92,6	95,5
Finland	0,0	69,5	85,1	89,2	93,5	92,7	97,0
Portugal	0,9	70,7	77,3	77,6	94,9	77,6	94,0
Greece	1,6	39,7	54,6	70,4	85,1	77,7	92,2
Slovakia	3,6	76,7	91,0	96,2	97,5	81,6	96,4
Luxembourg	3,6	16,7	28,9	94,3	97,4	88,0	99,3
Slovenia	1,2	78,6	82,1	86,9	89,8	88,5	96,3
Lithuania	2,8	72,8	82,8	85,0	92,4	91,4	96,1
Latvia	4,2	56,3	72,5	88,4	92,7	88,5	94,8
Estonia	3,0	54,3	72,0	88,5	95,3	64,9	93,2
Cyprus	1,3	21,7	29,6	56,2	72,5	86,1	95,5
Malta	1,4	22,4	51,3	57,1	91,6	88,7	97,3

Source: Eurostat, Comtrade.

Export market share developments crucially depend on trade data

This section presents the main empirical results. The chapter shows that the export market share concept is trivial only at a first glance, because different ways implementation yield different results and hence different conclusions for economic policy.

2.1 Heterogeneous results

First we present the results for the different computation methods introduced in Section 1 for TiVA and Comtrade data. In Figure 3 we present 48 graphs: Each row represents the result for a single country. We present the results for the eight biggest countries (measured in GDP) in the euro area: Germany, France, Italy, Spain, Netherlands, Belgium, Austria and Ireland. The columns reflect different data sources / country samples:

(1) OECD gross exports / gross imports including a rest of the world aggregate
(2) OECD domestic value added (DVA) including a rest of the world aggregate
(3) Comtrade gross export data excluding the rest of the world aggregate
(4) Comtrade gross export data including the rest of the world aggregate

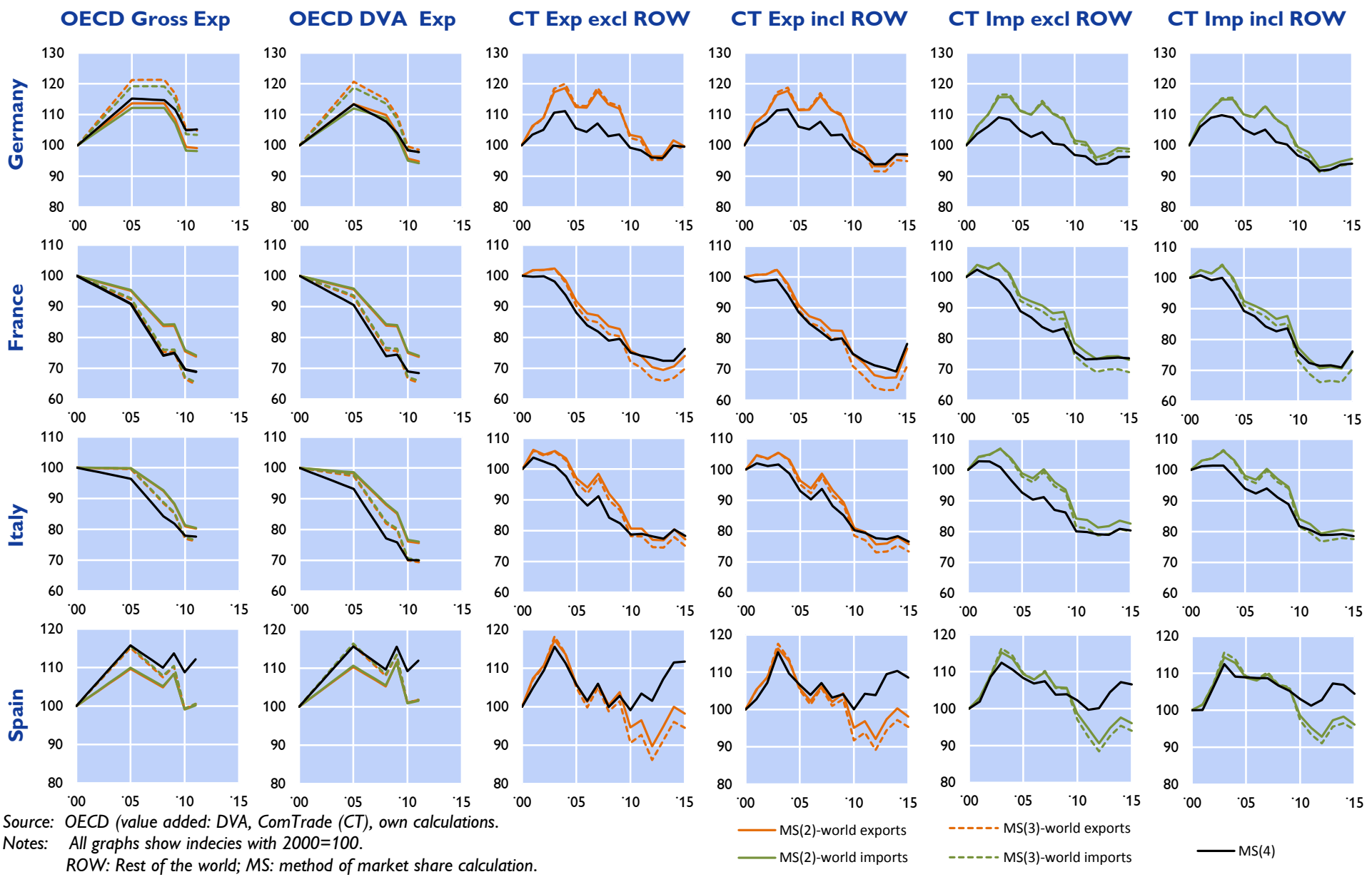
(5) Comtrade gross import data excluding the rest of the world aggregate
(6) Comtrade gross import data including the rest of the world aggregate

In each of these 48 figures, the market share development of the respective country for the respective data source is computed with the three methods introduced in Section 1:

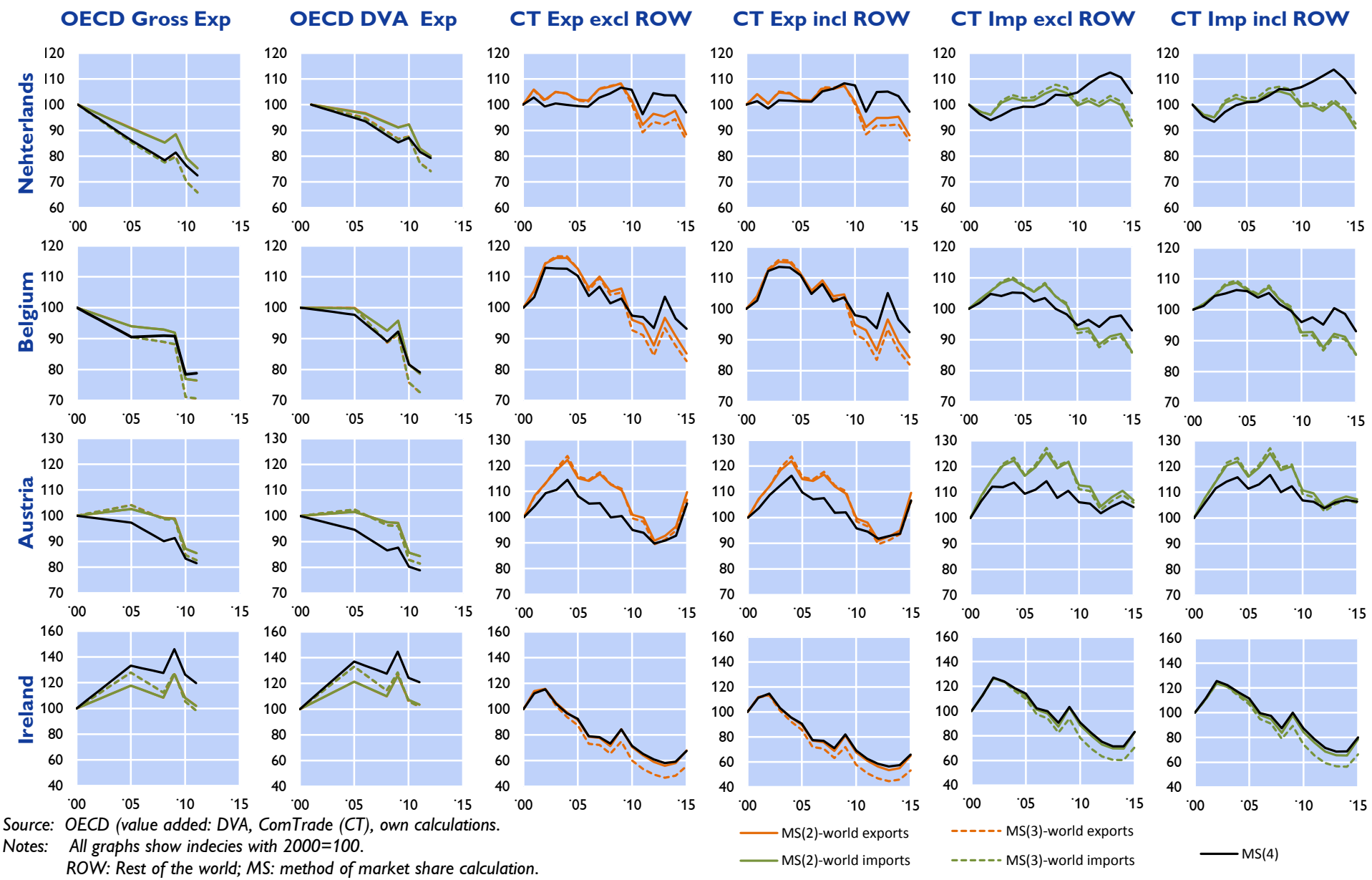
- the difference between the export shares of world trade (MS(2))
- the difference between export growth and world export growth, i.e. the EC method (MS(3))
- the difference between export growth and weighted import growth, i.e. the central banks' method (MS(4)).

To make the results comparable with the results from Figure 1, we present the data in the form of an index, with 2000 as the base year. This means that the results in the graphs are distorted by the staggered implementation of the repair-business regulation. Table 2 only presents the changes between 2006 and 2015, but only for the two key methods of the EC and the central banks.

Figure 3



Source: OECD (value added: DVA, ComTrade (CT), own calculations.
Notes: All graphs show indecies with 2000=100.
ROW: Rest of the world; MS: method of market share calculation.



Source: OECD (value added: DVA, ComTrade (CT), own calculations.
Notes: All graphs show indecies with 2000=100.
ROW: Rest of the world; MS: method of market share calculation.

Table 2

Overview market share calculations 2006 - 2011 (OECD) and 2006 - 2015 (all others)

Change in market share in %

	Method (3) Comparision with unweighted aggregat							Method (4): Comparison with weighted aggregat						
Source:	OECD		Com Trade				**European Commission** NA / BoPs	OECD		Com Trade				**Central banks** NA
Coverage:	goods & services		goods				goods & services	goods & services		goods				goods & services
Price adjustment	nom		nom				real	nom		nom				real
Data:	Exports= = Imports	DVA Exports incl ROW	Exports incl ROW	Exports excl ROW	Imports incl ROW	Imports excl ROW	Exports	Exports= = Imports	DVA Exports incl ROW	Exports with ROW	Exports excl ROW	Imports with ROW	Imports excl ROW	Exports / Imports
Germany	-13,5	-17,0	-15,1	-12,5	-13,6	-10,9	-9,7	-8,6	-12,2	-7,6	-4,6	-9,1	-6,3	6,5
France	-25,3	-25,3	-16,4	-18,5	-21,1	-23,6	-17,7	-19,3	-19,5	-7,7	-9,1	-13,1	-15,3	-6,2
Italy	-20,6	-24,7	-20,5	-18,6	-19,0	-16,6	-23,3	-15,9	-20,3	-15,2	-11,1	-15,0	-11,1	-15,5
Spain	-10,6	-10,1	-5,9	-5,3	-12,6	-12,8	-10,7	-1,5	-1,5	4,5	10,1	-3,9	-0,3	4,1
Netherlands	-20,3	-19,4	-15,2	-14,6	-9,8	-8,8	-12,9	-13,1	-12,6	-3,9	-2,3	3,3	5,4	2,5
Belgium	-21,6	-24,5	-22,0	-21,6	-18,7	-18,7	-14,9	-13,1	-16,6	-11,8	-10,2	-10,5	-9,1	1,6
Austria	-19,1	-18,9	-7,4	-6,8	-12,2	-12,2	-18,1	-14,1	-14,2	-0,3	0,0	-5,9	-6,1	-6,6
Ireland	-19,9	-19,6	-26,1	-23,7	-30,0	-27,5	36,3	-8,9	-9,7	-15,1	-14,2	-19,6	-18,7	26,2
Finland	-22,1	-24,4	-42,0	-38,9	-39,9	-36,5	-35,0	-25,2	-28,6	-39,4	-35,6	-38,2	-34,5	-21,7
Portugal	-8,1	-8,4	-9,9	-12,2	-10,9	-13,1	-6,7	3,2	2,6	6,5	9,5	2,5	4,6	13,7
Greece	-27,9	-30,3	1,8	-3,2	-7,3	-13,9	-28,1	-22,1	-24,9	8,0	10,2	-3,8	-4,2	-17,3
Slovakia	14,0	14,9	37,5	42,3	38,0	43,2	0,9	18,0	18,7	48,6	52,7	47,8	51,8	27,9
Luxembourg	4,5	-4,6	-35,0	-33,3	-33,8	-31,8	19,1	14,0	4,7	-25,0	-22,6	-22,0	-20,2	11,0
Slovenia	-19,9	-17,1	-7,0	-4,0	9,1	15,1	-7,4	-14,7	-10,4	4,2	10,4	19,2	28,1	11,1
Lithuania	38,3	33,0	48,6	48,6	44,5	42,9	33,2	38,7	31,6	50,7	52,4	48,3	49,8	23,5
Latvia	19,1	15,9	53,3	57,5	-0,6	-1,2	30,7	21,4	17,2	60,6	67,9	3,8	4,4	13,6
Estonia	-10,9	2,2	8,9	21,0	-3,8	6,6	19,4	-13,8	0,4	16,5	29,6	7,7	20,5	32,5
Cyprus*	-23,2	-20,2	-1,5	7,0	-51,9	-55,2	-22,6	-14,5	-12,3	4,0	36,3	-43,5	-43,8	-6,1
Malta	-30,1	-15,4	-23,7	-37,2	-10,2	-18,6	12,8	-24,2	-8,0	-24,2	-33,5	-11,2	-15,7	21,1

Source: OECD, ComTrade, European Commission, ECB, Eurostat, own calculations.

Note: European Commission method for Cyprus: 2008-2015

Based on Figure 3 and Table 2, there are four main results:

First, comparing gross with value-added trade data, market share developments do not differ systematically. This indicates that the additional piece of information, namely the share of value added domestically, does not change the overall picture.

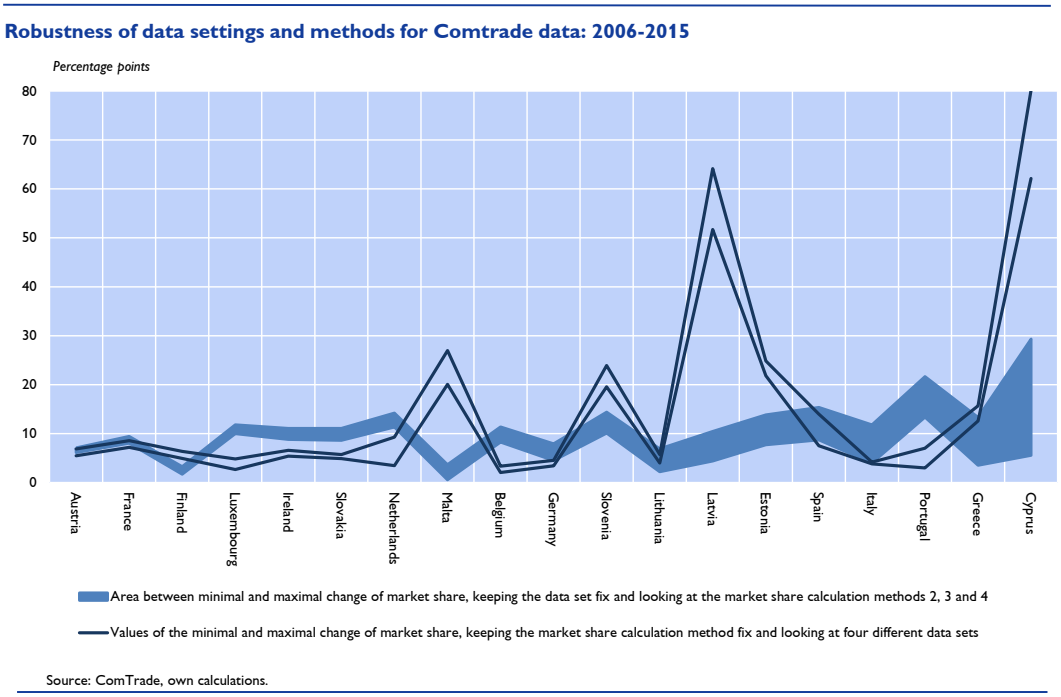
Second, when we assess graph by graph, Figure 3 highlights that the results of MS(2) and MS(3) are quite similar and – astonishingly – even the difference between MS(3) and MS(4) is not too big in many settings.

Third, looking at the 19 country results, and six data sets used, in 94% of the possible cases application of the central banks' method results in stronger gains of market shares than the EC method. This difference mainly reflects developments between 2009 and 2012. At this time European countries clearly lagged behind the worldwide growth momentum. This is also observable when looking at Appendix D with detailed results for all euro area countries.

Fourth, looking at the Comtrade data results in Table 2[21], we note that differences in the data set (using the same calculation method) are as important as differences in the method (using the same data setting). This is presented in Figure 4. For this figure the minimal and maximal change in market shares between 2006 and 2015 is plotted; keeping the data setting fixed (Comtrade exports or imports; including or excluding the ROW aggregate) and looking at the difference between calculation method (3) and (4) (see Section 1) and vice versa, keeping the method fixed. Including also method (2) but changing the data setting, Figure 4 shows that the differences between the minimal and maximal change is rather small in most countries. Only the use of different methods causes the spread to open up in the Baltic countries Lithuania, Latvia and Estonia and in the southern European countries Spain, Italy, Portugal, Greece and Cyprus. In contrast the spread regarding changing data is considerably larger in Malta, Slovenia, Latvia, Estonia and Cyprus.

[21] We only consider Comtrade data for this finding, as they are available until 2015.

Figure 4



Source: ComTrade, own calculations.

2.2 Export market share developments depend upon methods and data used

Once again looking at Figure 4, both the different methods and different data sources used are responsible for the different development of market shares.

The overall results for market share developments since 2006 are summarized in Table 3. The first column indicates the key reason for this work, namely the difference between the market share developments derived by the European Commission and by European central banks between 2006 and 2015. The differences are smallest for Italy, and biggest for Slovakia. As explained in Section 3.1., the EC method produces weaker market shares for almost all euro area countries (15). The differences will be attributed to methodical and data reasons below.

In Table 3 the methodical differences are additionally split in two components, namely the difference between the "exact method" (MS(2)) and the EC method (MS(3)); and the difference between the EC method and the central banks' method (MS(4)). Differences are calculated for all four data settings. For both cases the smallest and highest values are highlighted in green or red. In both methodical categories the differences are bigger when using export data. The last block on the right shows the spread that results when the method is kept fixed and the data sets are changed.

Table 3: Summary table of methodical and data differences

Differences between indices in 2015 compared to 2006 in percentage points		Methodical differences								Data differences		
		Difference between MS (2) method (exact) and MS (3) method (approximation)				Difference between MS (3) method (unweighted) and MS (4) method (weighted)				Differences between four CT data sets		
	Difference between market share calculations based on EC and central bank method	CT Gross exports excl. ROW	CT Gross exports incl. ROW	CT Gross imports excl. ROW	CT Gross imports incl. ROW	CT Gross exports excl. ROW	CT Gross exports incl. ROW	CT Gross imports excl. ROW	CT Gross imports incl. ROW	MS(2)	MS(3)	MS(4)
Germany	-16,1	1,6	1,4	1,2	0,9	-7,4	-7,9	-4,5	-4,6	3,4	4,2	4,5
France	-11,5	4,4	2,8	4,6	3,0	-8,7	-9,4	-8,0	-8,4	8,6	7,2	7,5
Italy	-7,9	1,2	0,7	1,9	1,5	-5,2	-7,5	-4,0	-5,6	4,2	3,8	4,2
Spain	-14,8	1,8	2,3	1,6	1,9	-10,4	-15,4	-8,7	-12,6	7,9	7,5	14,0
Netherlands	-15,3	1,9	1,7	-0,7	-1,1	-11,3	-12,3	-13,1	-14,2	3,4	6,4	9,3
Belgium	-16,4	1,7	1,6	0,4	0,4	-10,2	-11,4	-8,2	-9,6	2,1	3,3	2,7
Austria	-11,5	3,4	3,0	1,9	1,6	-7,1	-6,8	-6,3	-6,1	6,9	5,5	6,2
Ireland	10,1	10,5	10,2	10,0	9,7	-11,1	-9,4	-10,4	-8,8	6,6	6,3	5,4
Finland	-13,2	-1,1	-1,0	-0,4	-0,3	-2,5	-3,3	-1,7	-2,0	6,3	5,5	4,9
Portugal	-20,4	1,0	1,1	1,3	1,3	-16,4	-21,7	-13,3	-17,7	3,0	3,3	7,0
Greece	-10,8	-2,3	-1,6	0,0	0,9	-6,2	-13,3	-3,5	-9,7	12,6	15,7	14,4
Slovakia	-27,0	-3,9	-4,0	-5,1	-5,4	-11,1	-10,4	-9,8	-8,6	5,3	5,7	4,9
Luxembourg	8,1	0,7	0,4	0,6	0,2	-10,0	-10,7	-11,8	-11,6	2,6	3,2	4,8
Slovenia	-18,4	0,8	0,4	-1,0	-1,8	-11,3	-14,4	-10,1	-13,1	19,6	22,1	23,9
Lithuania	9,7	-15,2	-14,8	-13,8	-13,1	-2,2	-3,8	-3,9	-6,9	4,0	5,7	4,1
Latvia	17,1	-9,1	-10,4	-2,8	-3,4	-7,3	-10,5	-4,4	-5,6	51,7	58,7	64,2
Estonia	-13,1	-6,0	-7,9	-5,8	-8,1	-7,7	-8,6	-11,5	-13,8	22,7	24,8	21,8
Cyprus*	-16,5	2,4	3,3	2,9	2,8	-5,5	-29,3	-8,4	-11,3	62,7	62,1	80,1
Malta	-8,3	-9,3	-2,7	-9,6	-3,9	0,5	-3,7	1,0	-2,9	20,0	27,0	22,4

Source: European Commission (EC), ECB, Eurostat, own calculations.

Notes: MS ... market share; CT ... Comtrade; ROW ... Rest of the world; within each result block the smallest (highest) value for single country is highlighted in green (red);

* Cyprus EC method from 2008 to 2015

Summarizing the section on empirical results we conclude that both different methods and different data settings are responsible for the different development of market shares. The results and thus the economic policy conclusions are quite different.

Conclusions

Having describing several concepts, data sets and outcomes, the question remains which method is the correct one, and which data base is the best one? Clearly, there is no such thing as an optimal method/data source. Looking at methods first, the correct and thus first best solution is given by the difference of the export share of world exports. However, this method depends on the availability of world exports, which in many cases are unavailable. This is true especially for forecasts. The methods used by the European Commission and the central banks are only second-best solutions and this paper presents several arguments why they come up with different results.

The key question is: "Should policymakers follow the European Commission's approach or the central banks' approach?" Having discussed data and methodical issues, we conclude that, with a view to producing a comprehensive picture of foreign trade it would be important to take both goods and service data into account. There are three reasons to prefer import to export data: First, import data

rely on the country-of-origin principle; second, they are computed by one office and hence comparable across trading partners and third, imports are derived on a CIF basis and therefore better reveal the true value of the transported good or service. Finally, real data should be preferred to nominal data, otherwise trade of oil and other raw materials will influence the results, which is not desirable for European raw material-importing countries: If oil prices drop, the value of worldwide exports will decrease, even if everything else remains unchanged. As a consequence market shares of oil-importing countries will (exogenously driven) increase, the development is overestimated (Statisches Bundesamt, 2012).

On top of data-driven arguments there is a key methodical argument that has to be considered, namely the correct "counterparty". By evaluating market shares vis-à-vis the world, the EC considers all the developments in all regions of the world. Take the extreme example of a political overthrow in a big country, which ends up in split of the country. Everything else being unchanged but assuming strong trade linkages between the two new countries, export market shares of all European countries would clearly drop, as world trade has clearly increased. Actually nothing else happens through the trade integration of emerging economies in Asia and Africa. In contrast, when evaluating market shares vis-à-vis the existing trading partners, the central banks consider developments in the relevant export markets. Which counterparty definition is better suited, will depend upon the objective function.

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Appendix A: Market share concepts in a simple five-country example

This appendix illustrates the details of calculating the four different market share definitions for five countries: Austria, Germany, Italy, Switzerland and the U.S.A. Table A1 shows trade figures for goods from the UN Comtrade in SITC4 classification in billion USD for 2010 and 2013.

Bilateral exports are listed in rows, i.e. Austria exported goods worth USD 45.7 billion to Germany in 2010. Ignoring data inconstancies in this illustrative example, exports from country *i* to country *j* are considered as imports of country *j* from county *i*. Therefore the bilateral imports are listed in columns[22], i.e. Austria imported USD 71.2 billion from Germany. The second but one column on the right shows the sum of exports for each individual export country (i.e. USD 71.1 billion for Austria in 2010) and the second but one row from the bottom the import sum for each individual country (i.e. USD 90.3 billion for Austria in 2010). In this example "world" exports by definition are equal to world imports and shown in the bottom right corner, i.e. USD 642.9 billion for 2010. The last column on the right shows world exports, from the respective country view, i.e. in the case of Austria, world exports (USD 642.9 billion) minus Austrian exports (USD 71.1 billion), yielding Austrian-specific world exports of USD 571.8 billion. The last row shows world imports, from the respective country view, i.e. in the case of Austria world imports (USD 642.9 billion) minus Austrian imports (USD 90.3 billion), yielding Austrian-specific world imports of USD 552.6 billion.

[22] As explained in Section 2 UN Comtrade export numbers do not mirror import figures.

Table A1. Export and import matrices

Period 1

2010, bn USD Export destination Exporters	AUT	DEU	ITA	CHE	USA	Export sum	World exports, without considered country
AUT	0,0	45,7	11,4	7,4	6,6	71,1	571,8
DEU	71,2	0,0	77,5	55,8	86,8	291,3	351,6
ITA	10,5	57,8	0,0	21,0	26,8	116,1	526,8
CHE	6,2	37,8	15,4	0,0	19,8	79,1	563,8
USA	2,3	48,0	14,2	20,7	0,0	85,3	557,7
Import sum	90,3	189,3	118,4	104,9	140,0	642,9	
World imports, without considered country	552,6	453,7	524,5	538,0	502,9		

Period 2

2013, bn USD Export destination Exporters	AUT	DEU	ITA	CHE	USA	Export sum	
AUT	0,0	48,8	10,6	8,9	8,9	77,2	647,6
DEU	71,2	0,0	70,2	63,6	117,8	322,8	402,0
ITA	11,3	64,4	0,0	27,1	35,9	138,7	586,1
CHE	7,1	42,4	16,2	0,0	26,8	92,5	632,3
USA	3,5	46,9	16,8	26,5	0,0	93,6	631,2
Import sum	93,1	202,4	113,7	126,1	189,5	724,8	
World imports, without considered country	631,7	522,4	611,1	598,6	535,3		

As explained in Section 1, market share concepts (1) and (2) are based upon the absolute and relative difference of the market share: This share can practically be derived in two different ways: The export sum (i.e. for Austria USD 71.1 billion) can either be divided by global exports (excluding exports of the respective country, i.e. USD 571.8 billion) or alternatively by world imports excluding imports in the respective country. (i.e. USD 552.6 billion for Austria). This yields a share of 12.9 %, respectively 12.4%. Using world exports or imports would bias the results, as the home market is ruled out for exports by definition. As long as the countries considered are small, the two shares (exports relative to exports or imports) are very close.

At this point we also consider the bilateral market shares (see Table A2). Exports from country *i* to country *j* are divided by the import sum of country *j*, i.e. the share of Austrian exports in Germany (24.2, see Table A2) is derived by 45.7/189.3. The shares of the trading partner sum up to 100.

Table A2. Market share concepts (1) and (2)

Market share in respective market - period 1

Exporters \ Export destination	AUT	DEU	ITA	CHE	USA	World market share via total imports	World market share via total exports
AUT		24,2	9,6	7,1	4,7	12,9	12,4
DEU	78,8		65,4	53,2	62,0	64,2	82,8
ITA	11,7	30,5		20,0	19,2	22,1	22,0
CHE	6,9	20,0	13,0		14,1	14,7	14,0
USA	2,6	25,4	12,0	19,7		17,0	15,3
Import sum	100	100	100	100	100		

Market share in respective market - period 2

Exporters \ Export destination	AUT	DEU	ITA	CHE	USA	World market share via total imports	World market share via total exports
AUT		24,1	9,3	7,1	4,7	12,2	11,9
DEU	76,5		61,7	50,4	62,2	61,8	80,3
ITA	12,1	31,8		21,5	19,0	22,7	23,7
CHE	7,7	20,9	14,2		14,2	15,5	14,6
USA	3,7	23,2	14,7	21,0		17,5	14,8
Import sum	100	100	100	100	100		

MA (1)

Absolut difference in market shares in **%-points**

Exporters \ Export destination	AUT	DEU	ITA	CHE	USA	World market share via total imports	World market share via total exports
AUT		-0,1	-0,3	0,0	0,0	-0,6	-0,5
DEU	-2,4		-3,7	-2,7	0,2	-2,4	-2,5
ITA	0,4	1,3		1,5	-0,2	0,6	1,6
CHE	0,8	1,0	1,3		0,0	0,7	0,6
USA	1,1	-2,2	2,7	1,3		0,5	-0,5
Import Sum	0,0	0,0	0,0	0,0	0,0		

MA (2)

Relative difference in market shares in %

Exporters \ Export destination	AUT	DEU	ITA	CHE	USA	World market share via total imports	World market share via total exports
AUT		-0,2	-3,2	-0,3	0,3	-5,0	-4,2
DEU	-3,0		-5,6	-5,2	0,3	-3,8	-3,1
ITA	3,8	4,2		7,5	-1,1	2,5	7,3
CHE	11,2	4,9	9,8		0,1	5,1	4,2
USA	44,4	-8,7	22,7	6,4		3,1	-3,0

Coming now to the market share definitions and calculations from chapter 1, we have the market share concept (1) for a single country as the absolute difference between the world market shares of two periods, i.e. for Austria MS(1): 12.2 - 12.9 = -0,6 percentage points for the import side and 11.9 - 12.4 = -0.5 percentage points for the export side.

Interesting to note, the row total or in other words the sum of all bilateral market shares from the exporters' side (i.e. for Austria: -0.1 + -0.3 + 0.0 + 0.0) does not sum up to the global market share development of the exporting country (-0.6 pp or -0.5 pp).

Appendix C shows the algebraic behind. Instead, the column total or in other words the sum of all bilateral market shares from the import side sum up to zero.

To derive the market share concept (2) we take the relative difference between the world market shares of two periods in time, i.e. for Austria MS(2): (12.2 - 12.9)/12.9 = -5.0% for the import side or (11.9 - 12.4)/12.4 = -4.2% for the export side. In this illustrative example for Austria, Germany and Switzerland the results are very close, for the U.S.A. however, the results have another sign.

Following Section 1, market share concepts (3) and (4) use another calculation method. The export growth of a specific country is compared with either the growth rate of the unweighted world development (MS(3)) or with the weighted world development (MS(4)). In the first part of Table A3, the % difference between the two periods are derived cell by cell, i.e. (48.8 - 45.7) / 45.7 = 6.7 % for Austrian exports to Germany. In the second part of table A3 the individual country growth rates are compared with the unweighted world import growth (excluding the destination country), i.e. 6.7 – 6.9 = -0.2 percentage points for Austria in Germany. The same can be done for the world market share, in this case the country specific results again do not add up to the aggregate development. In part three of the table the individual country results are weighted with the share of the bilateral country exports to the total export of the country, so for Austrian exports to Germany by 45.7 / 71.1 * 100 = 64.3%; hence 64.3% * -0.2 = -0.2 percentage points. In this case the world market shares can be derived as the sum of the weighted bilateral country results or by the difference from the growth of exports (for Austria 8.5%) and the weighted world imports excluding the home country (for Austria: 9.2%), which yields -0.7%. So finally by transforming the market share calculations it is possible to add up country-specific values to the aggregate.

Table A3. Market share concepts (3) and (4)

Relative difference in %

Export destination / Exporters	AUT	DEU	ITA	CHE	USA	Growth of exports
AUT		6,7	-7,1	19,8	35,7	8,5
DEU	0,0		-9,4	14,0	35,7	10,8
ITA	7,0	11,4		29,3	33,9	19,4
CHE	14,7	12,2	5,4		35,5	16,9
USA	48,9	-2,4	17,8	27,9		9,8
Unweighted import growth	3,1	6,9	-4,0	20,2	35,3	
Weighted import growth	9,2	14,1	15,5	11,6	8,2	12,7

Market shares as %-difference of export growth and unweighted import growth

Export destination / Exporters	AUT	DEU	ITA	CHE	USA	MA (3) World market share
AUT		-0,2	-3,1	-0,4	0,4	-5,8
DEU	-3,1		-5,4	-6,2	0,4	-4,3
ITA	3,9	4,5		9,1	-1,5	2,9
CHE	11,6	5,3	9,4		0,2	5,6
USA	45,8	-9,3	21,8	7,7		3,3

Market shares as %-difference of export growth and weighted import growth

Export destination / Exporters	AUT	DEU	ITA	CHE	USA	MA (4) World market share
AUT		-0,2	-0,5	0,0	0,0	-0,7
DEU	-0,8		-1,4	-1,2	0,1	-3,3
ITA	0,4	2,2		1,6	-0,3	3,9
CHE	0,9	2,5	1,8		0,0	5,3
USA	1,3	-5,2	3,6	1,9		1,5

Appendix B: Recalculation between methods MS(2) and MS(3)

$$MA(2) = \frac{d\left(x^{i,W}\right)}{x^{i,W}} = \frac{d\left(\frac{X_t^i}{X_t^W}\right)}{\frac{X_t^i}{X_t^W}} = \frac{\frac{X_2^i}{X_2^W} - \frac{X_1^i}{X_1^W}}{\frac{X_2^i}{X_2^W}} = \frac{\frac{X_2^i X_1^W - X_1^i X_2^W}{X_1^W X_2^W}}{\frac{X_2^i}{X_2^W}} = \frac{\left(X_2^i X_1^W - X_1^i X_2^W\right)}{X_2^i \, X_1^W}$$

replace X_1^W by X_2^W in the denominator

$$\frac{X_2^i X_1^W - X_1^i X_2^W}{X_2^i X_2^W} = \frac{X_2^i X_2^W - X_1^i X_2^W - X_2^i X_2^W + X_2^i X_1^W}{X_2^i X_2^W} = \frac{\left(X_2^i - X_1^i\right)X_2^W - \left(X_2^W - X_1^W\right)X_2^i}{X_2^i X_2^W}$$

$$\frac{\left(X_2^i - X_1^i\right)X_2^W - \left(X_2^W - X_1^W\right)X_2^i}{X_2^i X_2^W} = \frac{X_2^i - X_1^i}{X_2^i} - \frac{X_2^W - X_1^W}{X_2^W} = \frac{d\left(X^i\right)}{X^i} - \frac{d\left(X^W\right)}{X^W} = MA(3)$$

Appendix C: Difference between sum of individual country and aggregate share

This appendix shows that the sum of all bilateral market shares is not identical with the aggregate market share. In a first step we look at the change of the bilateral market share of Austrian exports in Germany, which is given by the quotient of the Austrian exports to Germany divided by the total imports of Germany: $\frac{X_{AT,DE_2}}{IM_{DE_2}} - \frac{X_{AT,DE_1}}{IM_{DE_1}}$

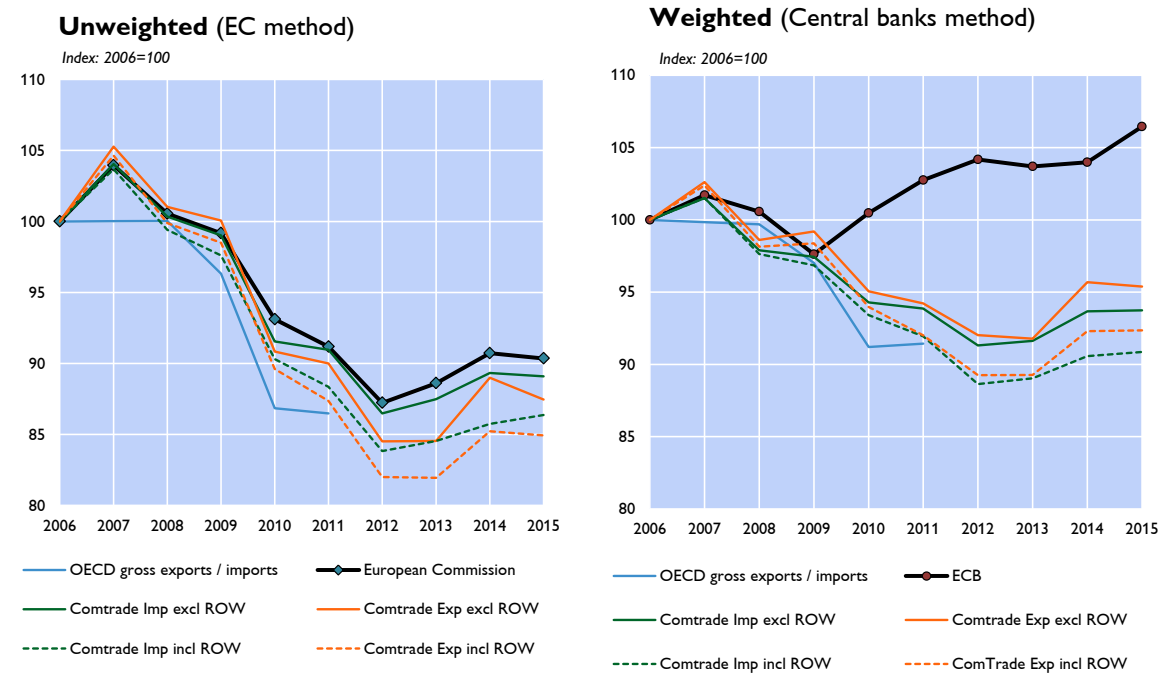
(instead of the imports in the denominator we could also write $IM_{DE} = \sum_{i=1}^{N} X_{i,DE}$ to get a classical market share definition as MS(3) in the paper). Rewriting the first expression based upon the levels in period one multiplied by the growth rate from period one to two gives: $\frac{X_{AT,DE_1}\left(1+g_{X_{AT,DE}}\right)}{IM_{DE_2}\left(1+g_{IM_{DE}}\right)} - \frac{X_{AT,DE_1}}{IM_{DE_1}}$. We can further rewrite this expression as one fraction and then rearranging for only one bracket: $\frac{X_{AT,DE_1}\left(1+g_{X_{AT,DE}}\right) - X_{AT,DE_1}\left(1+g_{IM_{DE}}\right)}{IM_{DE_2}\left(1+g_{IM_{DE}}\right)} = \frac{X_{AT,DE_1}\left(g_{X_{AT,DE}} - g_{IM_{DE}}\right)}{IM_{DE_2}\left(1+g_{IM_{DE}}\right)}$. In a more general case for many partner countries N we get: $\sum_{i=1}^{N} \frac{X_{AT,i_1}\left(g_{X_{AT,i}} - g_{IM_i}\right)}{IM_{i_2}\left(1+g_{IM_i}\right)}$.

Looking in a second step at the global market shares we have $\frac{X_{AT_2}}{IM^*_{W_2}} - \frac{X_{AT_1}}{IM^*_{W_1}}$ with $IM^*_W = \sum_{i=1}^{N} IM_i - IM_{AT}$. The formulation can again be transformed in various steps: $\frac{X_{AT_1}\left(1+g_{X_{AT}}\right)}{IM^*_{W_1}\left(1+g_{IM^*_W}\right)} - \frac{X_{AT_1}}{IM^*_{W_1}} = \frac{X_{AT_1}\left(1+g_{X_{AT}}\right) - X_{AT_1}\left(1+g_{IM^*_W}\right)}{IM^*_{W_1}\left(1+g_{IM^*_W}\right)} = \frac{X_{AT_1}\left(g_{X_{AT}} - g_{IM^*_W}\right)}{IM^*_{W_1}\left(1+g_{IM^*_W}\right)}$. The denominator can be re-expressed to $\frac{X_{AT_1}\left(g_{X_{AT}} - g_{IM^*_W}\right)}{IM^*_{W_1}\left(1+g_{IM^*_W}\right)} = \frac{X_{AT_1}\left(g_{X_{AT}} - g_{IM^*_W}\right)}{\sum_{i=1}^{N} IM_2^i - IM_2^{AT}}$.

To conclude, while the nominator is almost identical in both expressions, with the minor difference that in the case of the bilateral sum we look at world imports and in the case of the aggregate development we look at world imports reduced by domestic imports. The bigger difference is given in the denominator: in the first case the summation runs over the whole fraction, while in the second case only over the denominator. Simulations for the euro area countries, with most of them being relative small vis-à-vis the world, have shown that results are very similar, yet never identical.

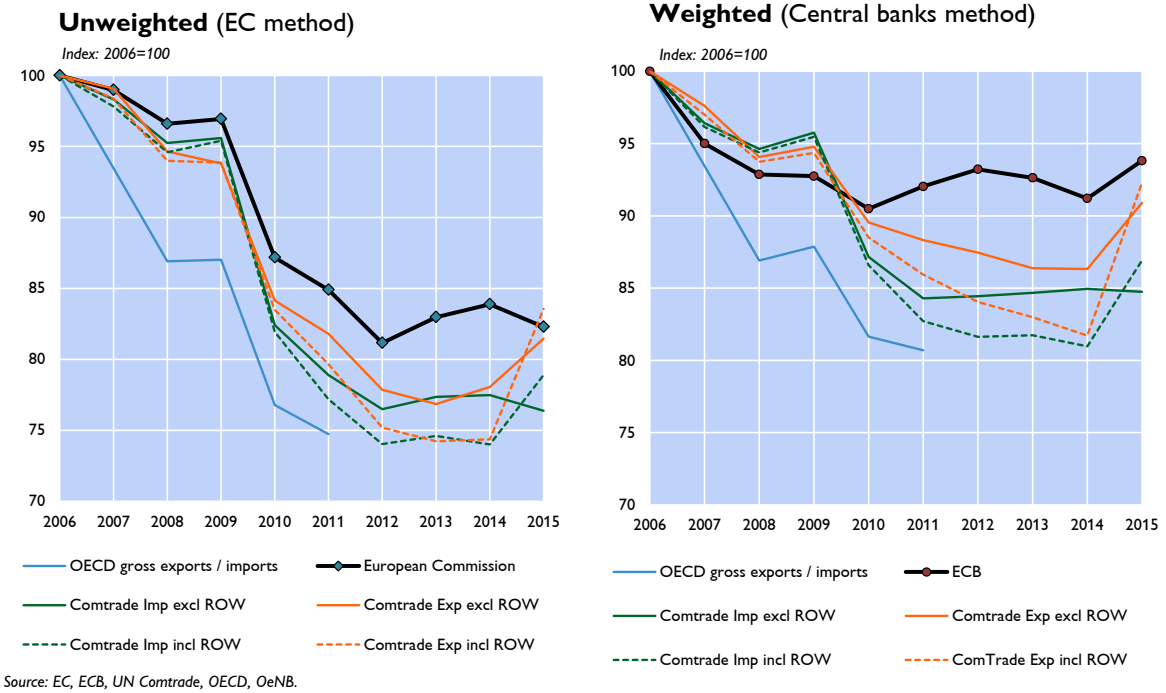
Appendix D: Detailed country results

Market share developments: Different data sources and different calculation methods: Germany



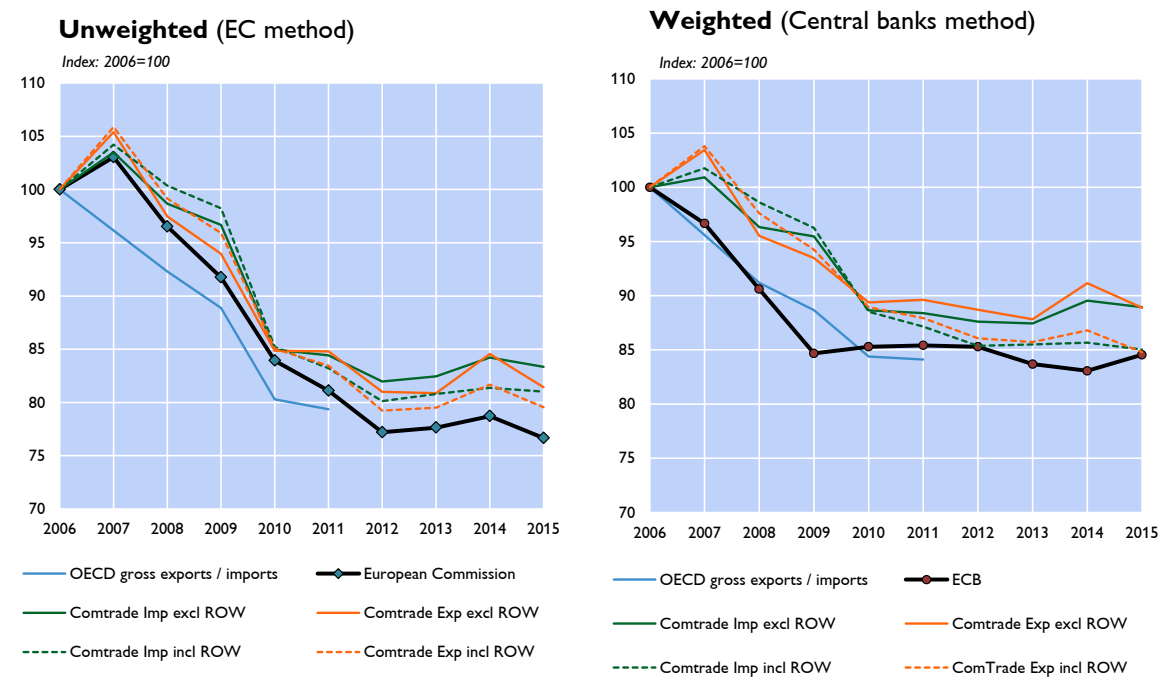
Source: EC, ECB, UN Comtrade, OECD, OeNB.

Market share developments: Different data sources and different calculation methods: France



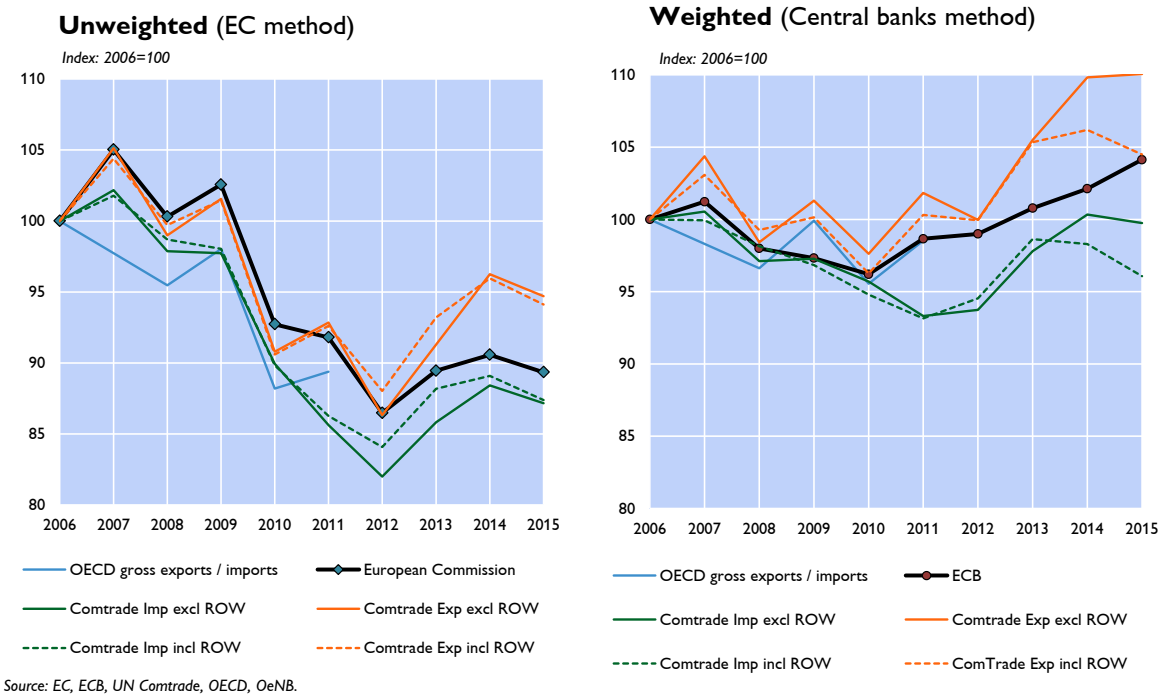
Source: EC, ECB, UN Comtrade, OECD, OeNB.

Market share developments: Different data sources and different calculation methods: Italy



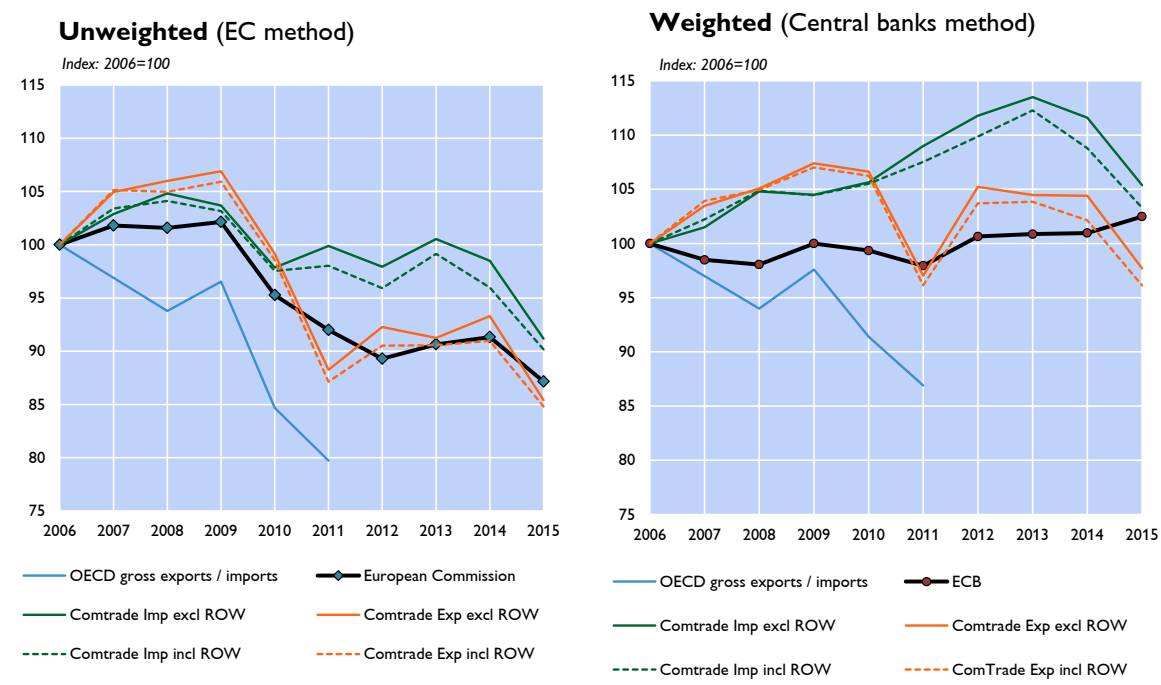
Source: EC, ECB, UN Comtrade, OECD, OeNB.

Market share developments: Different data sources and different calculation methods: Spain



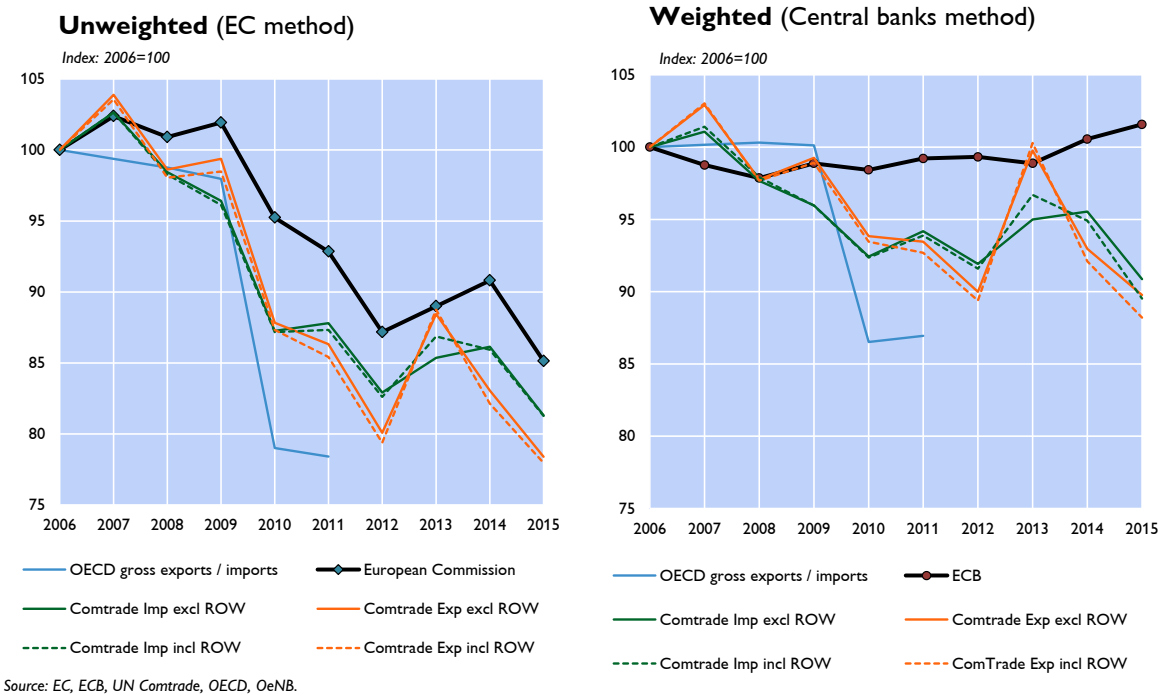
Source: EC, ECB, UN Comtrade, OECD, OeNB.

Market share developments: Different data sources and different calculation methods: Netherlands



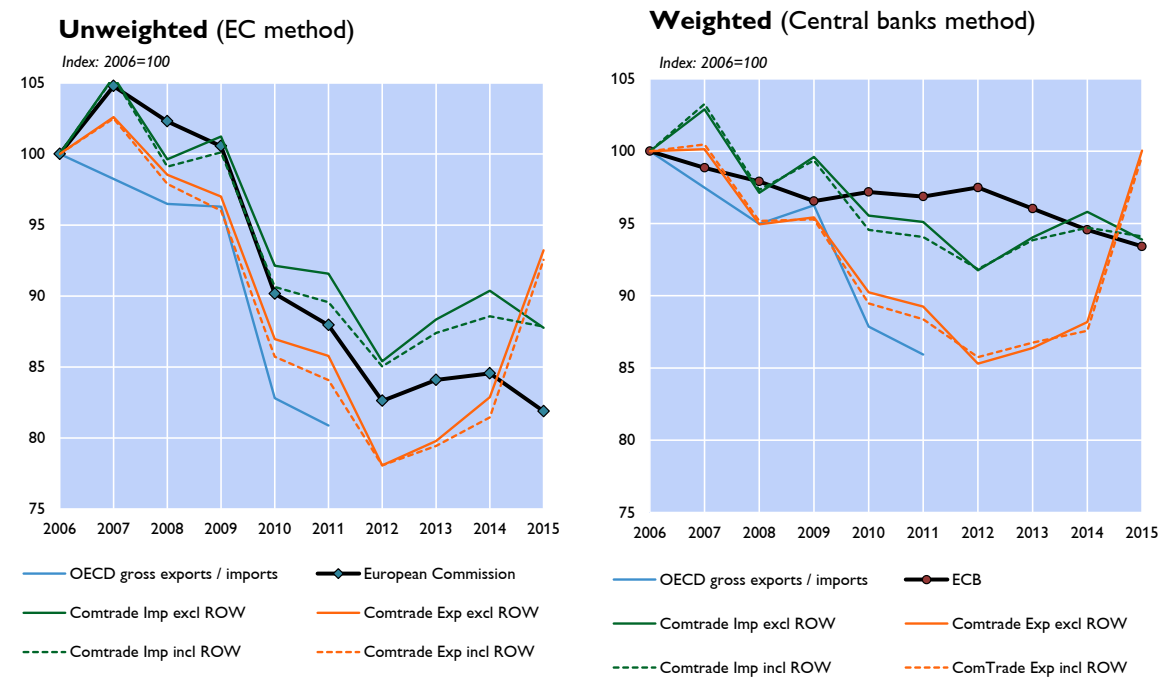
Source: EC, ECB, UN Comtrade, OECD, OeNB.

Market share developments: Different data sources and different calculation methods: Belgium



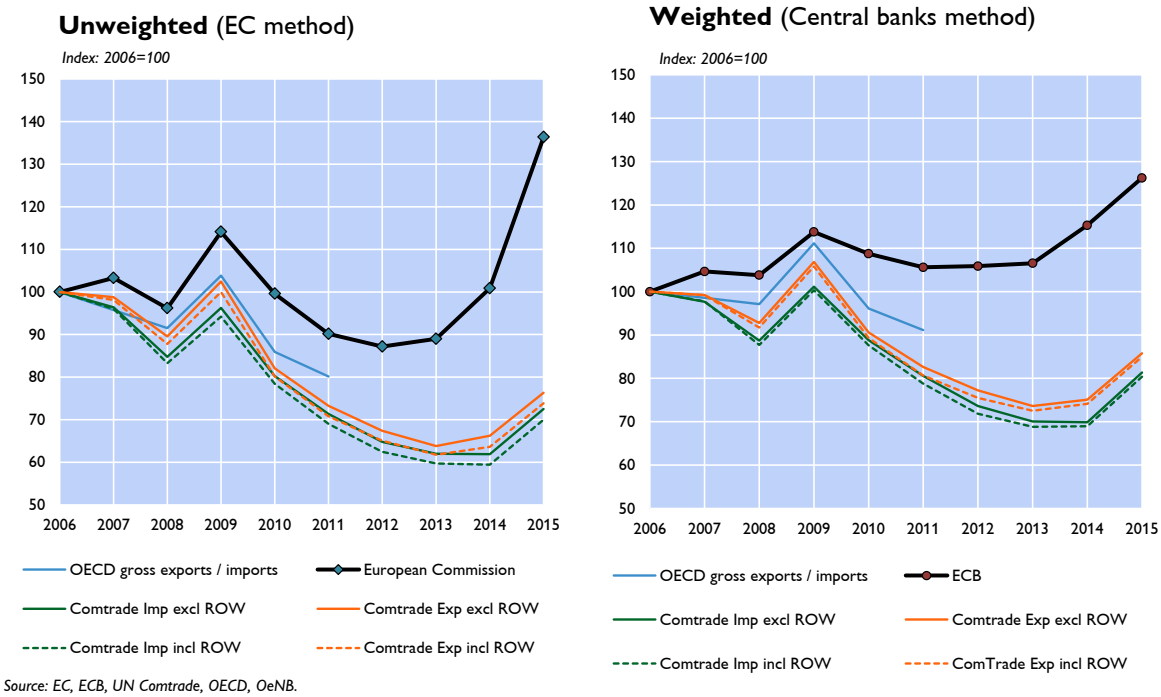
Source: EC, ECB, UN Comtrade, OECD, OeNB.

Market share developments: Different data sources and different calculation methods: Austria



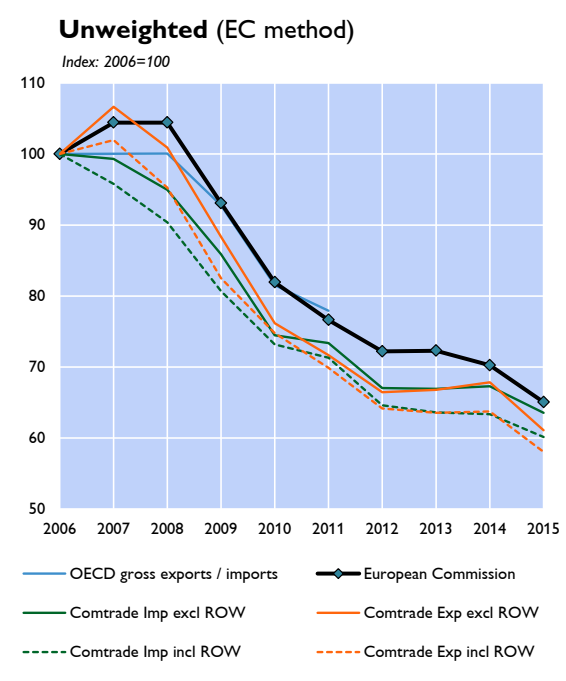
Source: EC, ECB, UN Comtrade, OECD, OeNB.

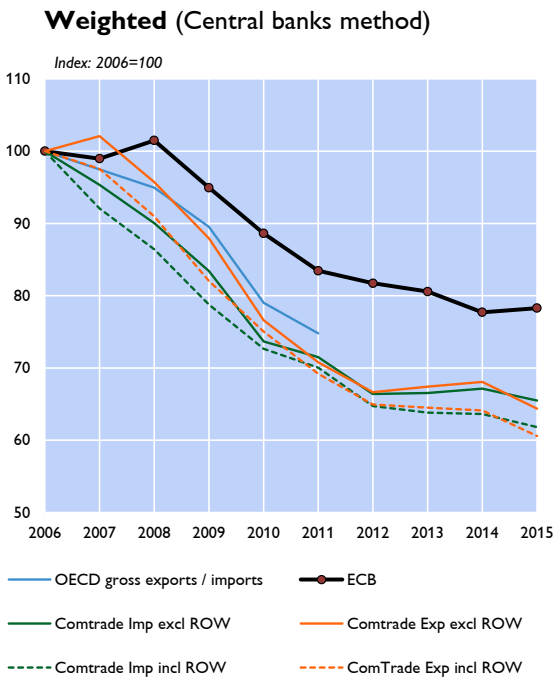
Market share developments: Different data sources and different calculation methods: Ireland



Source: EC, ECB, UN Comtrade, OECD, OeNB.

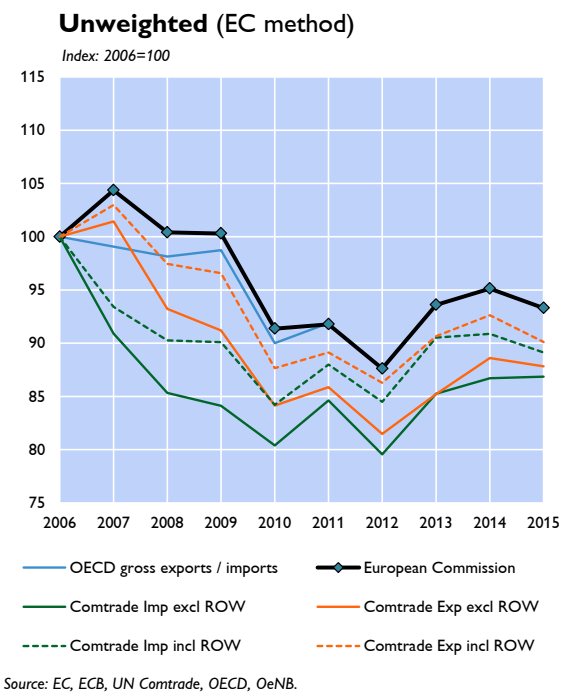
Market share developments: Different data sources and different calculation methods: Finland

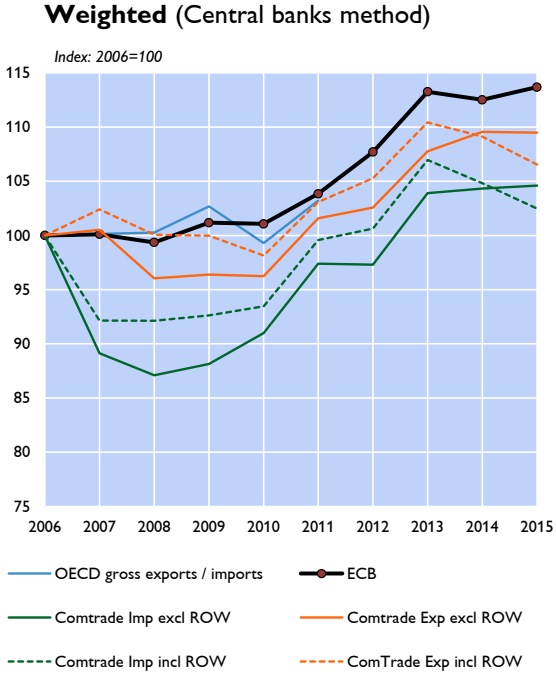




Source: EC, ECB, UN Comtrade, OECD, OeNB.

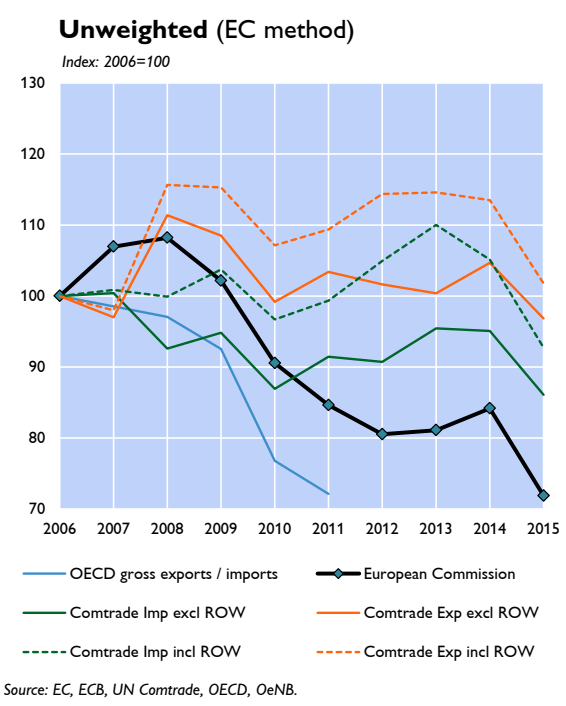
Market share developments: Different data sources and different calculation methods: Portugal

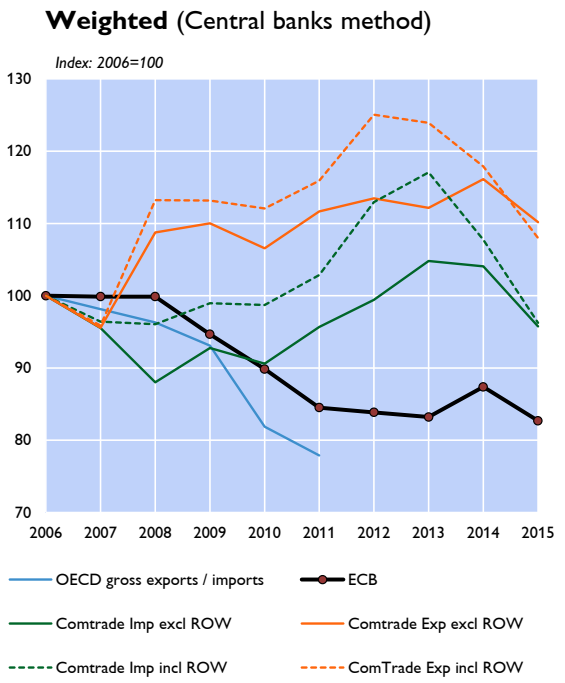




Source: EC, ECB, UN Comtrade, OECD, OeNB.

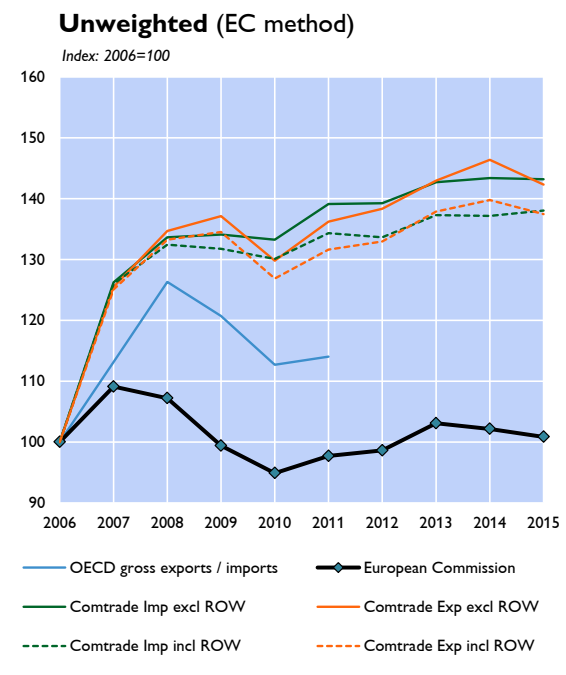
Market share developments: Different data sources and different calculation methods: Greece

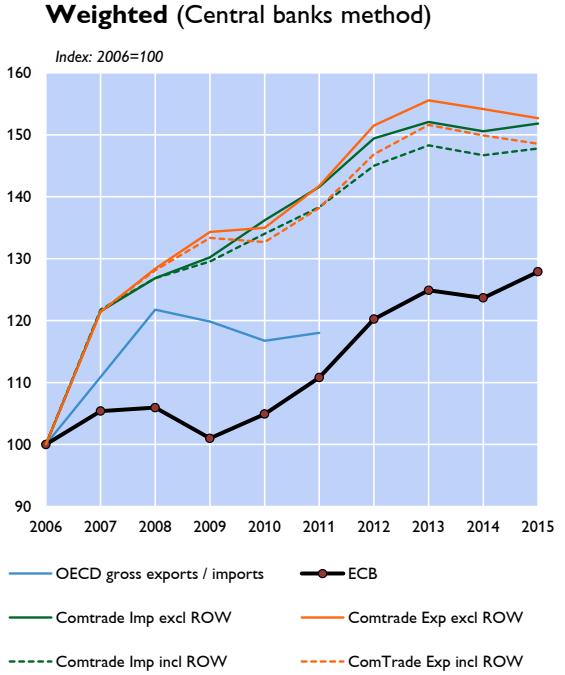




Source: EC, ECB, UN Comtrade, OECD, OeNB.

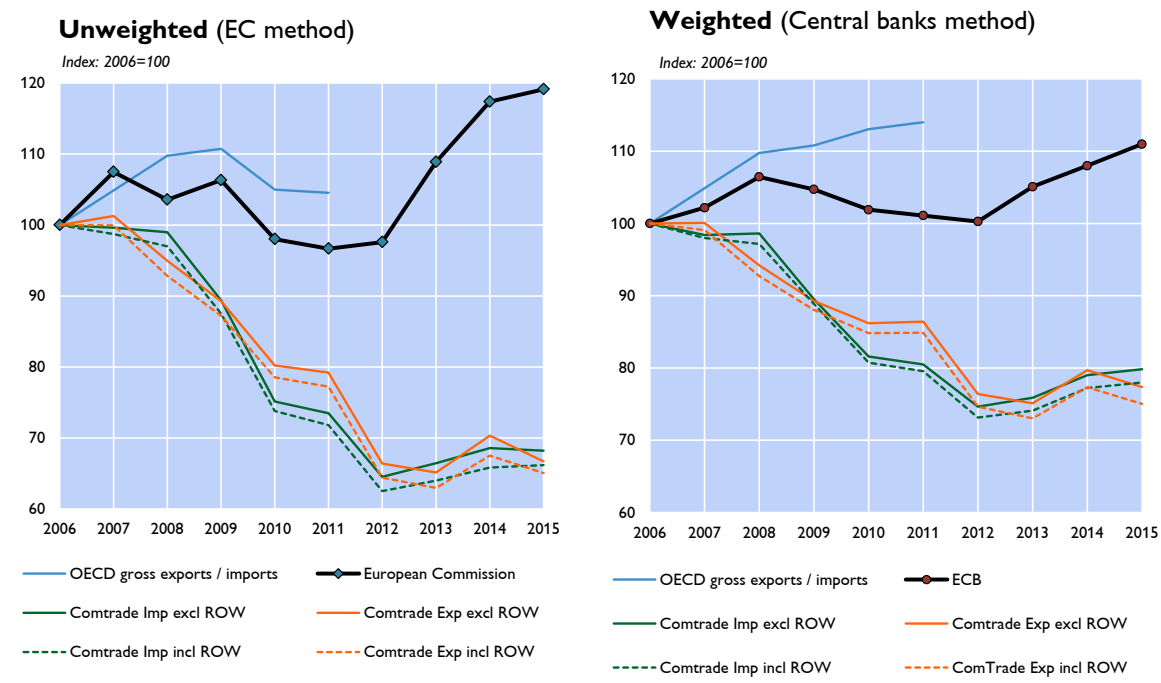
Market share developments: Different data sources and different calculation methods: Slovakia





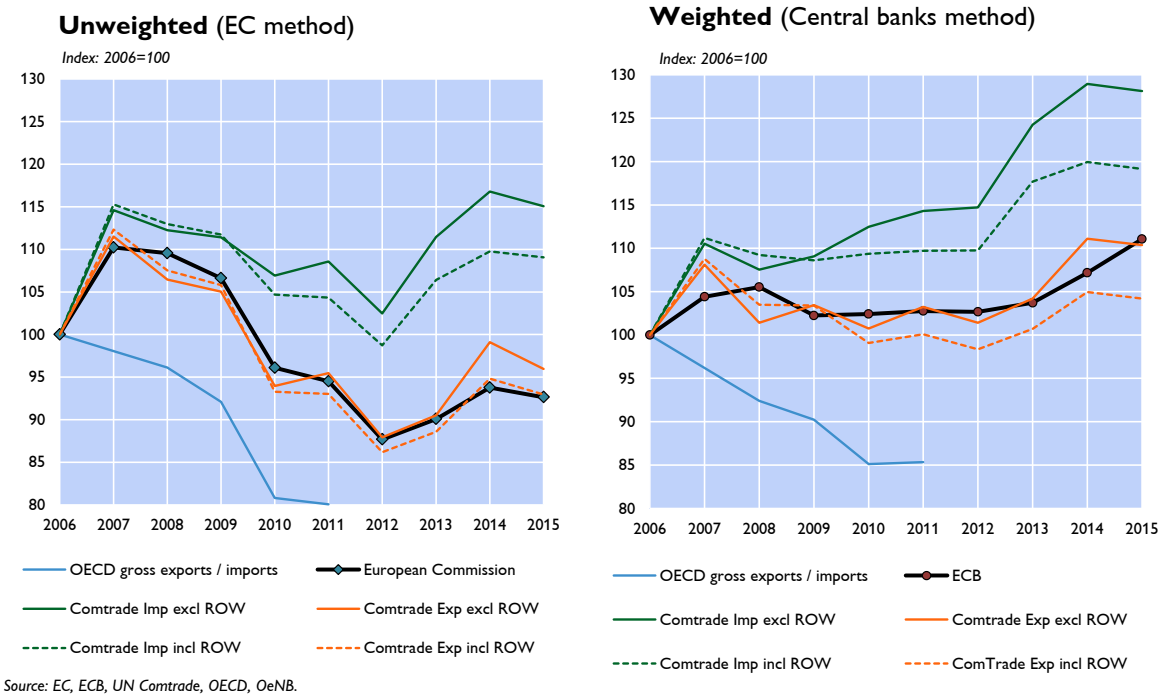
Source: EC, ECB, UN Comtrade, OECD, OeNB.

Market share developments: Different data sources and different calculation methods: Luxembourg



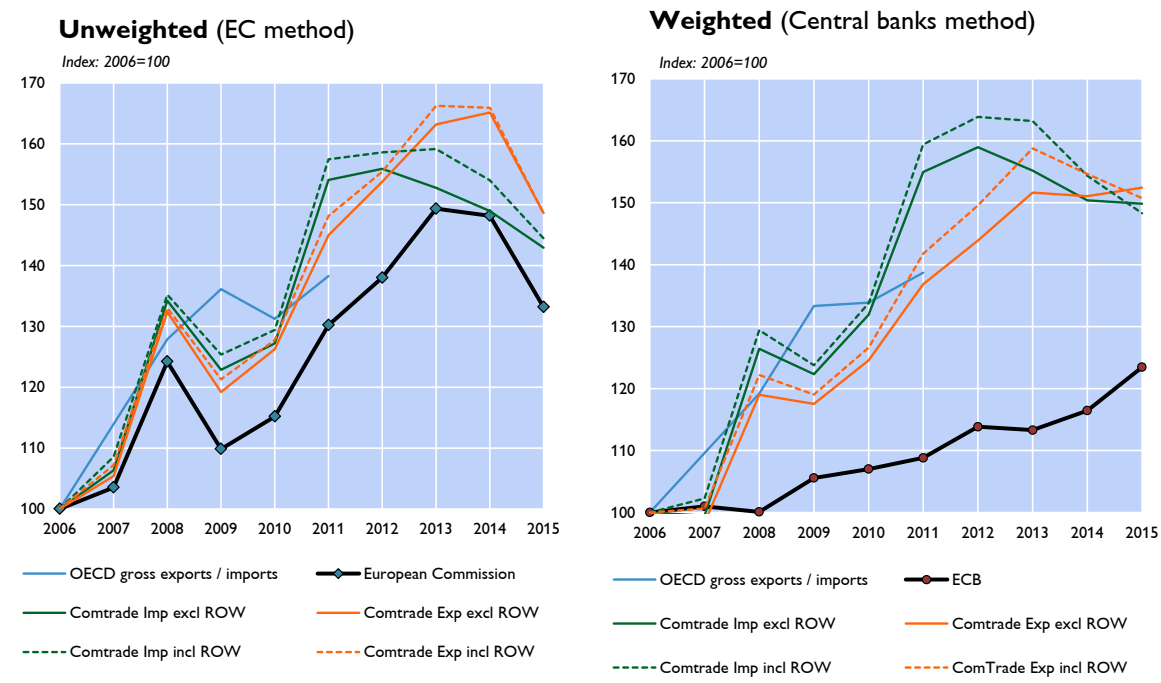
Source: EC, ECB, UN Comtrade, OECD, OeNB.

Market share developments: Different data sources and different calculation methods: Slovenia



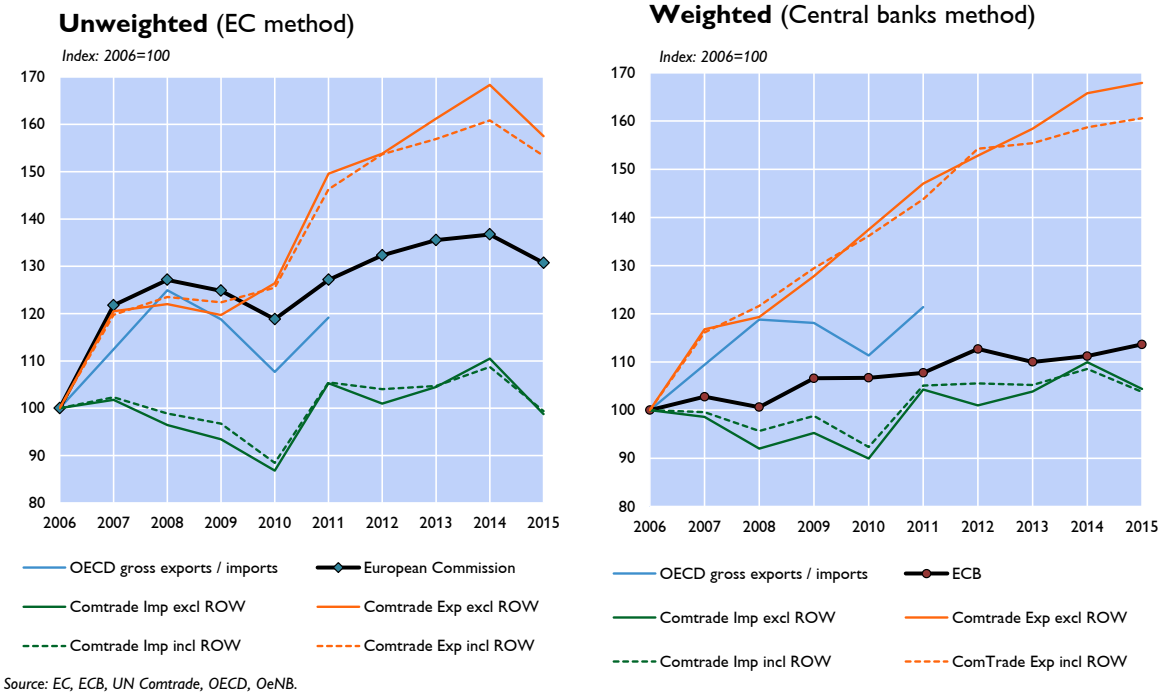
Source: EC, ECB, UN Comtrade, OECD, OeNB.

Market share developments: Different data sources and different calculation methods: Lithuania



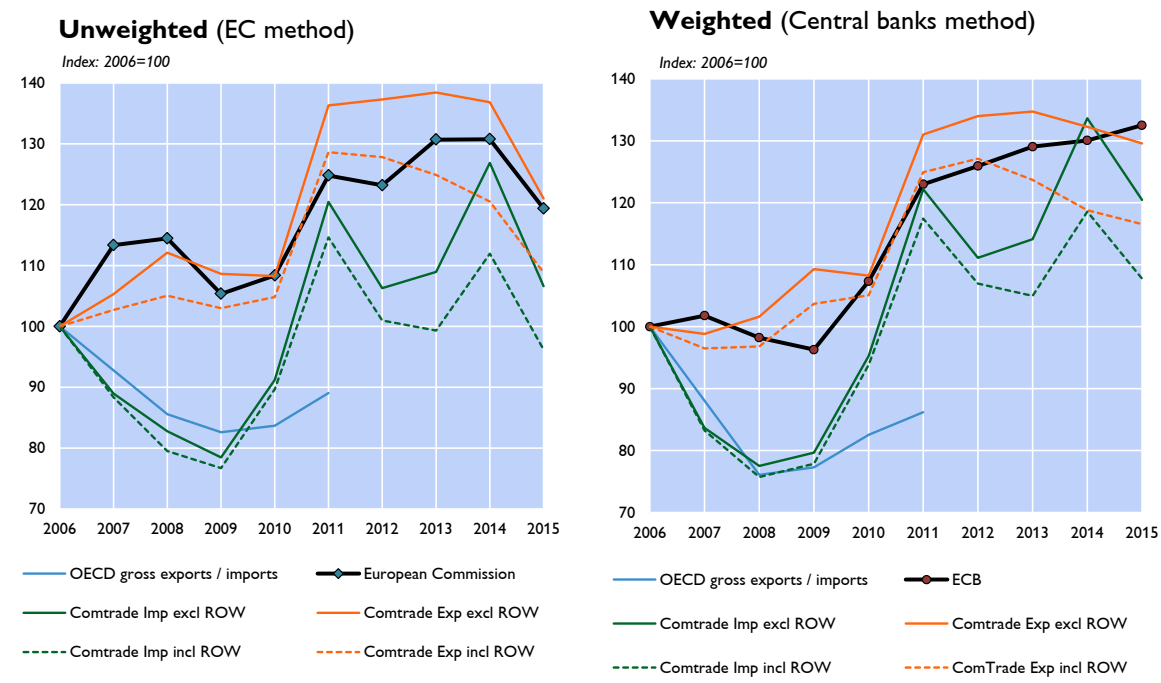
Source: EC, ECB, UN Comtrade, OECD, OeNB.

Market share developments: Different data sources and different calculation methods: Latvia



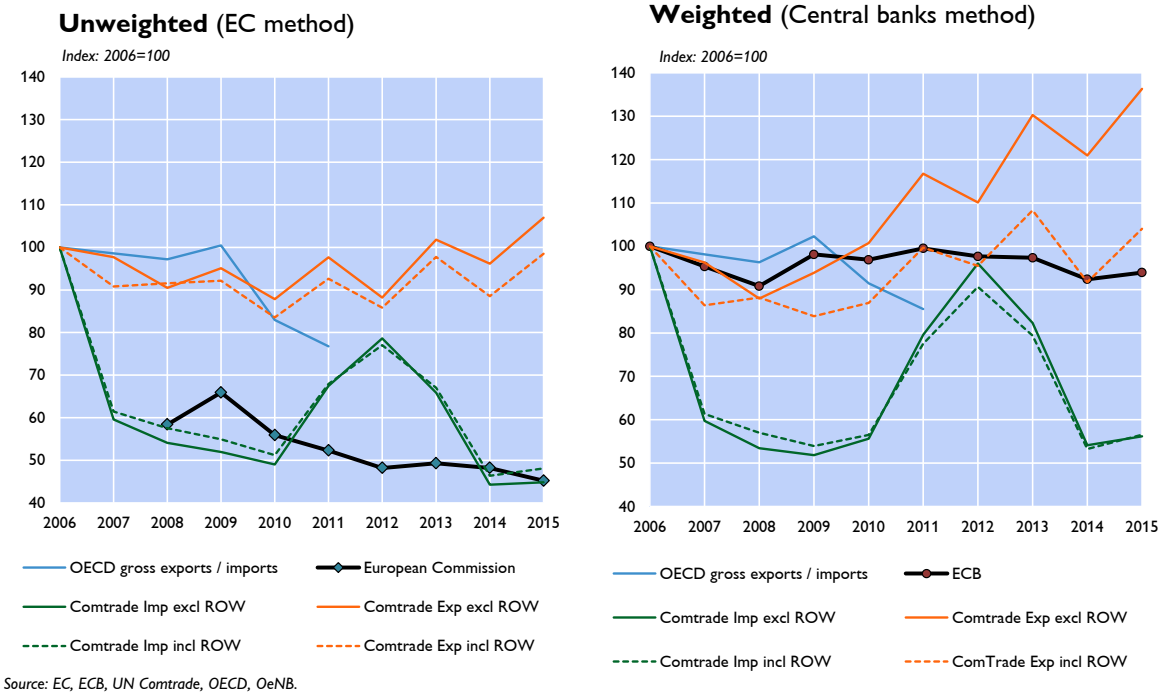
Source: EC, ECB, UN Comtrade, OECD, OeNB.

Market share developments: Different data sources and different calculation methods: Estonia



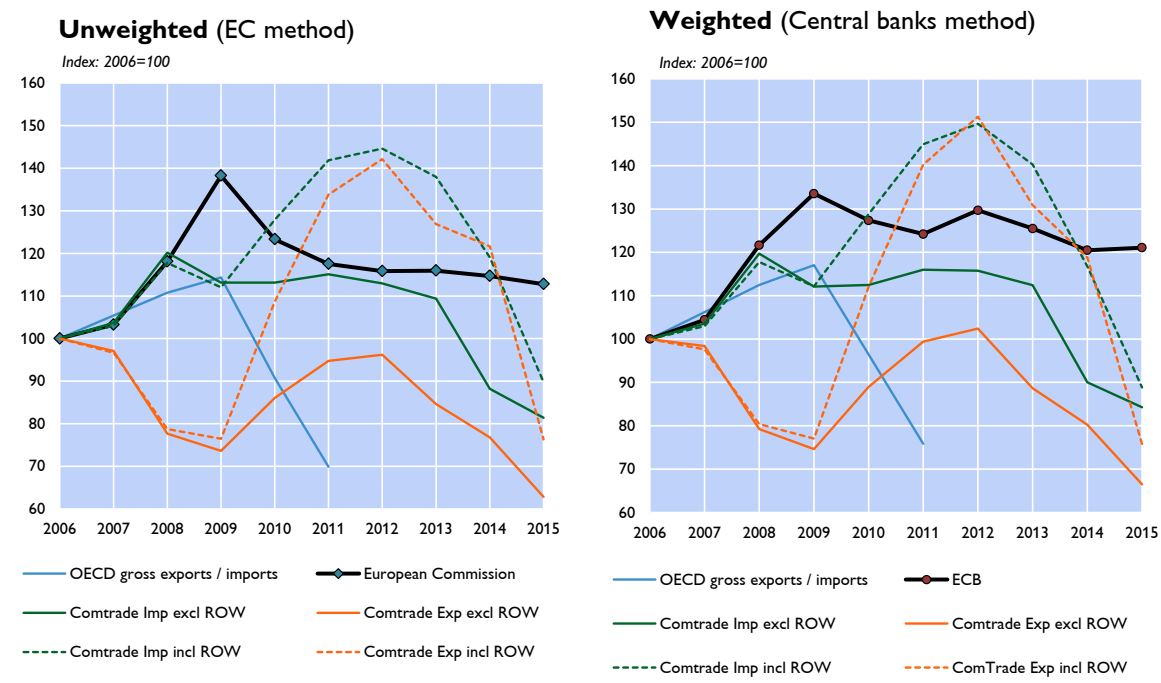
Source: EC, ECB, UN Comtrade, OECD, OeNB.

Market share developments: Different data sources and different calculation methods: Cyprus



Source: EC, ECB, UN Comtrade, OECD, OeNB.

Market share developments: Different data sources and different calculation methods: Malta



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