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TRADING PROCESSING FOR GOODS: A DIFFERENT VIEW FROM THE PAST ON ITALIAN TRADE FLOWS?

by Ludovico Bracci*, Silvia Fabiani** and Alberto Felettigh**

Abstract

The new international standards for national accounts and balance of payments statistics (ESA 2010 and BPM6) introduced a new treatment of goods sent abroad for processing without changing ownership, now considered as an exchange of services. In this paper we explore to what extent this innovation affects the structural analysis of Italian trade flows, in particular along the geo-sectoral dimension. We also draw, for the first time, a detailed picture of exports and imports of processing services in order to shed light on how Italian firms participate, through this channel, in global value chains. Our findings largely validate the geo-sectoral interpretations based on the previous statistical standards. The data reveal that Italy is historically a net exporter of processing services, especially for high-technology products; flows are highly concentrated across destinations and sectors.

JEL Classification: F10, F14, F62 .
Keywords: trade, processing services, global value chains.

Contents

* Italian National Statistical Institute (Istat). The usual disclaimer applies.

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1. Introduction

In 2014 new international standards – the European System of National and Regional Accounts (ESA 2010) and the sixth edition of the International Monetary Fund's "Balance of Payments and International Investment Position Manual" (BPM6) – were implemented in European statistics, as part of an internationally coordinated process that affected a wide range of key economic indicators derived from national accounts and balance of payments. The update was aimed at a more accurate measurement of economic activity, in an increasingly interconnected and knowledge-based world economy.

Two changes envisaged by the new accounting standards, both in National Accounts (NA) and in Balance of Payments (BP), significantly affected the recording of international trade in goods and services. The first is the definition of trade in goods, which is now restricted to the cases where a change in property occurs and is reflected in the novel treatment of goods sent abroad for processing: the flows related to products that cross the frontier for being processed abroad without changing ownership are excluded from transactions in goods. Such flows are now considered as exports or imports of processing services and are recorded on a net basis, so as to capture the sole processing-fee component.[1] The second change concerns the purchase and subsequent resell of goods that do not physically enter the domestic territory of the trader ("merchanting"). The trade margin on these re-selling transactions is now registered as a net export of goods. Beside these two methodological changes, the new official measures of trade in goods include also an estimate of some illegal transactions.[2]

These innovations also introduced a wedge between NA/BP data on the one side and international merchandise trade statistics (IMTS) on the other, since the latter did not undergo a revision of the underlying definitions. As a broad guideline, Table 1 sketches the main conceptual differences now existing between the two sets of statistics.

The new statistical standards allow a better description of a reality that is characterized by the growing internationalization of production processes. Due to the diffusion of global value chains, intermediate goods are increasingly shipped abroad for processing, re-imported and ultimately assembled into final goods for export or for domestic sale, without change in property.[3] A recording system based on the effective change of ownership principle guarantees a closer alignment between statistics on international trade flows, business accounting and financial transactions, therefore improving the internal consistency of national accounts.

A further advantage of the new statistical standards is that they move a step forward in the direction of "disinflating" gross trade flows, excluding transactions that do not add to domestic value added. As global production involves subsequent stages that take place in different countries, goods cross the national border more and more frequently, back and forth, with or without change of ownership: by recording the value of the good each time it enters the country, trade statistics adhere to their mandate, but the domestic value added embodied in that good is being double-counted by gross trade flows.[4] In general, in an increasingly globalized world it may be very misleading to map export dynamics into GDP growth without simultaneously analyzing the evolution of imports as well (that is, the "import content of exports").

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[1] Processing services are defined as transactions in manufacturing services on physical inputs owned by others; they cover processing, assembling, labelling, packaging, etc. of goods by a contractor enterprise in exchange for a fee by the owner of the goods.

[2] Imports and exports of drugs and imports of smuggled tobacco. See Istat (2014) for a comprehensive summary of innovations introduced in National Accounts to overcome the formal reservations relating to consistent implementation of standard rules among European countries.

3 Imports of processed goods are not necessarily connected to a subsequent export activity; rather, they should be related to domestic output, independently of whether it is sold internally or abroad: also firms that produce only for domestic sale may use inputs that have been processed abroad.

[4] Double-counting in gross flows cancels out when considering net flows, whose contribution to GDP growth is not at stake. On the issue of measuring such double-counting, see for example Koopman, Wang and Wei (2014) and Cappariello and Felettigh (2015).

Table 1: IMTS *v* NA/BP data: main conceptual differences between old and new standards (1)

Statistical standards:	Flows recorded by:			
	IMTS (international merchandise trade statistics)	NA/BP (national accounts and balance of payments)		
	exports and imports of goods	exports and imports of goods	exports of services	imports of services
Unaffected by change in standards	All cross-border flows, independently of change in property	---	---	---
Old standards (ESA 1995, BPM5)	---	Transactions between residents and non-residents (independently of change in property and thus equal to IMTS cross-border flows)	---	---
New standards (ESA 2010, BPM6)	---	Only transactions between residents and non-residents entailing a change in property(2)	Fees received by residents for processing in Italy foreign-owned goods (without a change in property)	Fees paid to non-residents for processing abroad Italian goods (without a change in property)

Notes: (1) The table is only meant as a general indication of the relationships between the different statistical domains: see the methodological appendix for a rigorous exposition. (2) Merchanting and illegal transactions are also included.

At the same time, however, these statistical innovations have a potential drawback for the geo-sectoral analysis of import and export flows, which is historically based on international merchandise trade statistics. IMTS data, which basically coincide with official NA and BP figures compiled according to the previous standards (ESA 1995 and BPM5), continue to register the (legal) physical movements of goods across borders, even when they are associated with the provision of a processing service. It follows that they now need to be interpreted with more caution: the adjustment that national accounts operate in order to remove, starting from IMTS data, gross flows of products for processing may substantially change the structure and the dynamics of international merchandise trade both in terms of sectoral composition and counterpart countries.

Does this happen, in practice? This question is indeed the first focus of our paper, which aims at understanding whether and to what extent the IMTS geo-sectoral details for Italy over the 1995-2014 period are still valid for interpreting macroeconomic aggregates, i.e. national accounts and balance of payments trade in goods series (at current prices). The second objective is to draw, for the first time, a detailed picture of Italian trade flows of processing services, and to shed light on how domestic firms exploited, through this channel, the opportunities offered by the growing international fragmentation of production and the diffusion of global value chains.

Our findings largely confirm both the geo-sectoral analysis conducted in the past on the basis of the previous standards and the meaningfulness of continuing with the use of disaggregated IMTS data for the interpretation of the new NA/BP trade data. Only few sectors, which were strongly affected by the new treatment of processing, deserve some specific attention: pharmaceutical and refined oil products on the export side; leather products, apparel and refined oil products on the import side.

The new data reveal that Italy is historically a net exporter of processing services, although the surplus is modest, around €1 billion per year on average in the last five year. Flows are highly concentrated along geographical and sectoral dimension. In 2010-14 Switzerland and Germany accounted for almost half of total exports; Romania and Germany for more than one third of total imports. Around two thirds of the flows were due to just four sectors: pharmaceutical, refined oil products, metal products and basic metals on the export side, clothing,

leather, metal products and transport vehicles other than automobiles on the import side. Overall, Italian firms are net importers of processing services in low-tech productions (apparel, leather products and textiles) and net exporters in high-tech productions (mostly pharmaceutical products); the deficit in the former compensates the surplus in the latter and the overall positive balance mirrors the surplus in medium-tech - and scale intensive – sectors (chemicals and refined oil products).

The rest of paper is organized as follows. Section 2 provides an overview of the main changes occurred in NA/BP data on goods and services trade with the implementations of the new statistical standards. Section 3 explores the relationship between IMTS and the new NA/BP disaggregated data on merchandise trade. A detailed analysis of the Italian trade of processing services, along the sectoral and geographical dimension, is presented in Section 4. Section 5 concludes.

2. Trade in goods and in processing services: an overview

Overall, the changeover to the new statistical standards had a modestly negative impact on the level of trade in goods, though increasing over time in absolute value, for both exports and imports (from below 1% of total flows in 1995 to above 3% at the end of the period; Figg. 1 and 2). The effect on the annual growth rates was more erratic and in both directions, but contained, with some exceptions, in the narrow range between -0.5 and 0.5 per cent.

Figure 1: Goods exports
(at current prices)

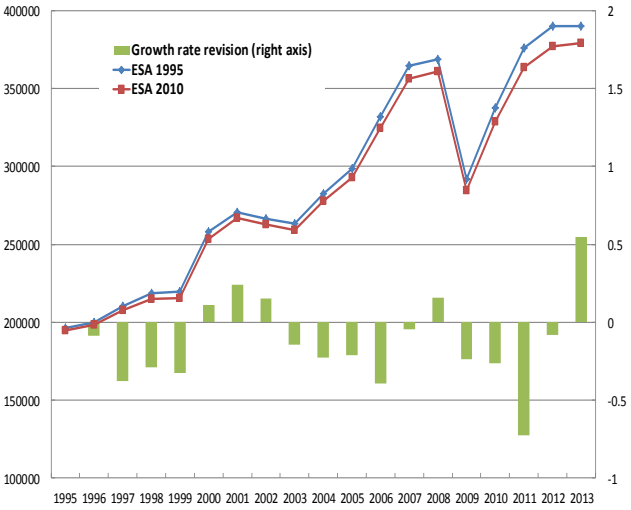
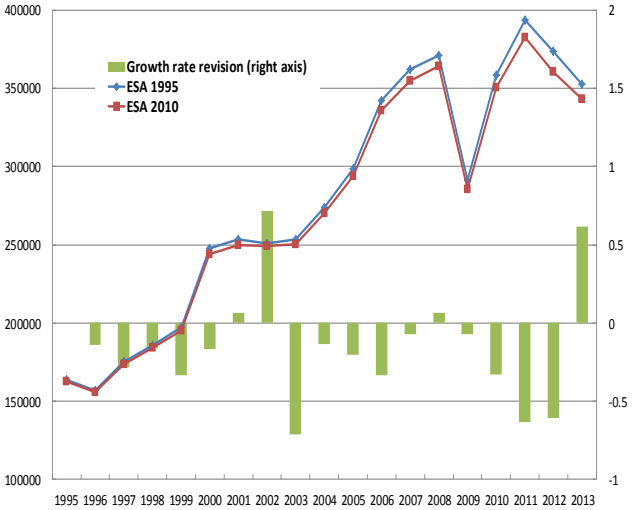


Figure 2: Goods imports
(at current prices)



Source: our elaborations on Istat data.

A decomposition identifying the contribution of the various innovations to the overall revision of the level of goods exports and imports (Tab. 2) clearly shows that the main role was played by the new treatment of processing, whereas the inclusion of illegal transactions and of merchanting only had a minor impact.

It follows that, in order to assess the effects of the new methodological standards on Italian external trade, it suffices to focus on the recording of processing services. The analysis in the rest of the paper will be carried out by comparing IMTS (c.i.f.-f.o.b.) with a dataset, elaborated by national accountants, where IMTS are adjusted to compile trade flows according to the change of ownership principle adopted in NA and BP. In such a dataset merchanting flows, illegal transactions and expenditures made in ports by carriers are not included and imports

are evaluated on a c.i.f. basis, so that a fully homogeneous comparison with IMTS is possible. In the following sections we will refer to this (c.i.f.-f.o.b.) dataset as "NA/BP data".

Table 2: Decomposition of revisions between ESA 2010 and ESA 1995
(averages over five-year periods; percentage points)

	Exports of goods					Imports (f.o.b.) of goods				
Source	1995-99	2000-04	2005-09	2010-13	**Mean**	1995-99	2000-04	2005-09	2010-13	**Mean**
Processing	-1.65	-1.94	-2.55	-3.49	-2.48	-1.39	-1.59	-2.15	-3.24	-2.19
Illegal transactions	0.05	0.05	0.04	0.04	0.04	0.62	0.41	0.34	0.34	0.40
Merchanting	0.38	0.38	0.36	0.45	0.40					
Other (1)	-0.03	-0.04	-0.04	-0.04	-0.03	-0.03	-0.02	-0.07	-0.04	-0.04
TOTAL	**-1.24**	**-1.54**	**-2.19**	**-3.03**	**-2.08**	**-0.79**	**-1.20**	**-1.87**	**-2.84**	**-1.80**

Source: our elaborations on Istat data.
Notes: (1) For exports, this item includes the effect of residual reclassifications and the revision of IMTS data for 2013; for imports it also includes the revisions in c.i.f.-f.o.b. adjustment and in expenditures made in ports by carriers.

As anticipated in the introduction, goods that are imported or exported for processing without change of ownership are no longer included in NA/BP trade flows; rather, processing fees are recorded as a service in a new category labelled "manufacturing services on physical inputs owned by others".

On the one hand, this change should not impact, in principle, the overall balance; that is, the goods balance under the old standards should coincide with the sum of the goods balance and of the processing services balance in the new standards,. This holds under the assumption that the value of the processing service amounts to the difference between the value of the good after processing and before processing. However, due to holding gains or losses, inclusion of overheads[5] and, more in general, errors in the recording of shipments of goods for processing, this assumption need not hold and the changeover in statistical standards ceases to be neutral for the overall balance. In the case of Italy, the assumption has held so far to a very high degree: exports of goods have been revised downwards more than imports and such negative impact on the merchandise balance has been almost entirely offset by a positive balance in processing services. The sum of these two components is negative in the time span we analyze, but negligible (less than €500 million on average, with a weight on GDP less than 0.03%).

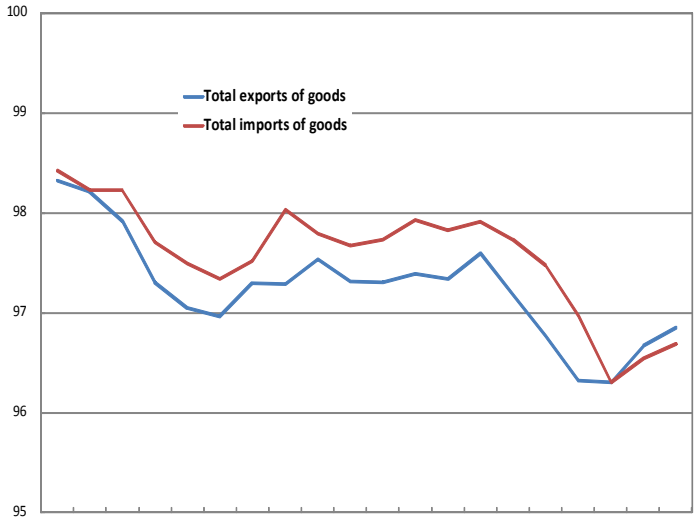
On the other hand, as goods that are imported or exported for processing are no longer recorded, aggregate NA/BP trade flows tend to be smaller than their IMTS counterparts. As Figure 3 shows, the overall discrepancy for Italy is typically larger on the export side than on the import side, and fluctuated over time, with larger changes in the last few years, though never exceeding 4 percentage points.

The fact that revisions tend to be larger for exports in Figure 3 is mirrored in Italy consistently being a net exporter of processing services (Fig. 4). The value of both exports and imports grew at a significant pace between 1995 and 2000and broadly stabilized in the subsequent seven years, oscillating afterwards. In the most recent five-year period, the balance was on average positive for slightly more than €800 billion, originating from transactions with euro-area and extra-EU countries, and only partially compensated by the negative balance with EU economies outside the euro area (especially Eastern Europe; Fig. 5).

[5] See for example BPM6, par. 10.6.

Figure 3: The relationship between NA/BP data and IMTS

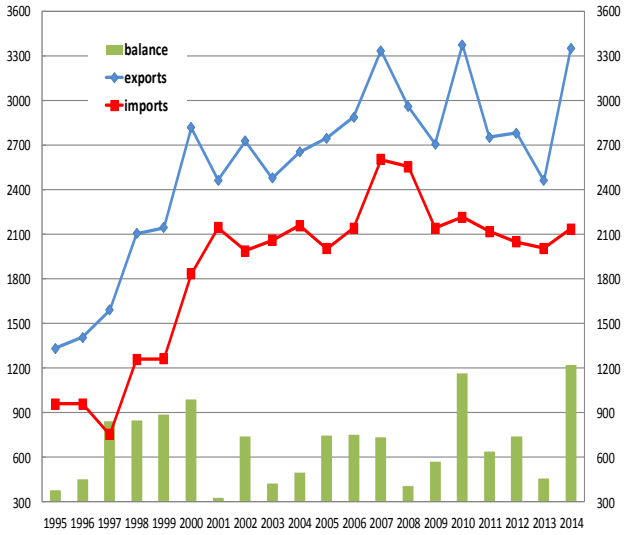
(percentage ratio between NA/BP and IMTS data at current prices)



Source: our elaborations on NA/BP and Istat data.

Figure 4: Processing services…

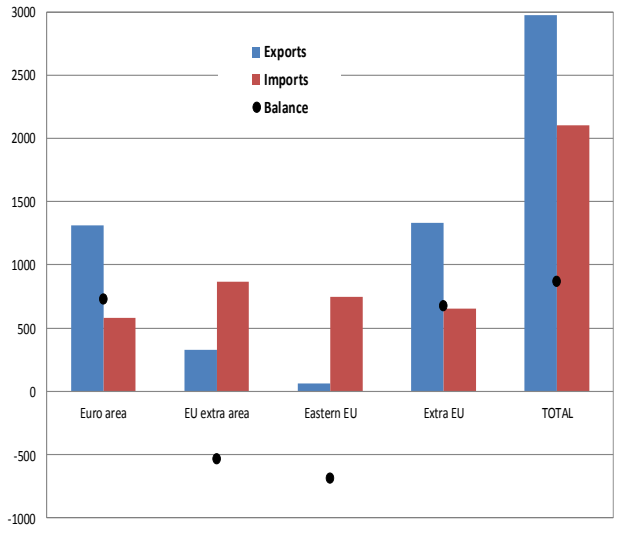
(at current prices; EUR millions)



Source: our elaborations on NA/BP data.

Figure 5: … by geographical area in 2010-2014

(yearly averages at current prices; EUR millions)



Source: our elaborations on NA/BP data.

3. Goods trade

3.1 The differences between NA/BP and IMTS data

The previous statistical standards guaranteed an almost perfect match between NA/BP data (on a c.i.f.-f.o.b. basis) and IMTS data, while in the new accounting framework the "temporary" flows associated with goods for processing (without a change in property) must be subtracted from the latter to attain the NA/BP counterpart definitions. A short methodological appendix is provided at the end of this paper describing how these estimations are accomplished (see also Bracci and Pascucci, 2015); a few technical details need however to be highlighted here as they are essential to our economic analysis below.

In the ideal case where the goods return to the country of ownership after processing ("symmetric flows"), the treatment of inward processing flows requires that individual transactions be followed so as to identify: (i) temporary imports of foreign-owned goods that are to be processed in Italy, and (ii) the restitution of those same

goods, after they have been processed in Italy, to their foreign owner. The former flow is to be subtracted from IMTS imports, while the latter flow is to be subtracted from IMTS exports. As for the ideal treatment of outward processing flows, this requires the identification of: (i) temporary exports of Italian-owned goods that are to be processed abroad, and (ii) the restitution of those same goods, after they have been processed abroad, to their Italian owner. The first flow is to be subtracted from IMTS exports, while the second is to be subtracted from IMTS imports.

In real life, however, it may happen that after processing the goods do not return to the country of the owner but are sold directly in the processing country (or in a third country), or that the goods are not shipped to the processing country from the country of the owner but are purchased directly in the processing country. In these cases IMTS will show only one of the two flows – the one for processing or the one after processing ("asymmetric flows") – and the adjustment from IMTS to NA/BP data is more complex. Practical guidance on the different adjustment to be applied to IMTS data can be found in Eurostat (2014) and UNECE (2015).

In particular, processing a good may change its nature, as detected by the Statistical Classification of Products by Activity (CPA). For instance, crude oil is classified as a raw material under "mining and quarrying"; after being processed at a refinery, it becomes a product of manufacturing (a "refined petroleum product"). In other cases, the input and the output of processing are different products within manufacturing: for instance, processing may turn chemical products (CPA 20) into pharmaceutical products (CPA 21), or basic metals (CPA 24) into fabricated metal products (CPA 25). The change of nature plays an important role especially in the treatment of IMTS "asymmetric flows", as the following example clarifies.

Suppose a foreign owner ships a tanker of crude oil to Italy, where the raw material is processed, and half of the refined petroleum is shipped back to the foreign owner while the remaining half remains in Italy for domestic sale (on behalf of the foreign owner). In such an example, IMTS would register the value of the entire tanker of crude oil under temporary imports and the value of half tanker of refined petroleum under exports. With the new accounting standards the half tanker of refined petroleum that remains in Italy for domestic sale is in fact an import of goods: the circumstance is equivalent, disregarding transportation costs, to the case where the entire tanker of refined petroleum was shipped back to the foreign owner, who then sold half of it to Italian residents. In summary, relative to IMTS, NA/BP data would estimate lower imports of crude oil and lower exports of refined petroleum (the "temporary flows" mentioned above), but would also record higher imports of refined petroleum.[6] The main point is that, while NA/BP export and imports of goods typically are a fraction of the corresponding IMTS data, this doesn't necessarily apply in the presence of "asymmetric flows", as shown by the imputed imports of refined petroleum in the example. As we shall see below, such anomalous cases do emerge for refined oil products as well as for chemical products that are processed in Italy into pharmaceutical ones for domestic consumption.

Apart from these two exceptions, in the data we present here NA/BP figures for exports and imports of goods are always a fraction of their IMTS counterparts. At the aggregate level the ratio is fairly close to 100, as already shown in Figure 3: in the period 1995-2014 it spanned between 96.3 and 98.3 per cent for exports and, almost identically, between 96.3 and 98.4 per cent for imports. There is however a rather high heterogeneity both across products and across geographical counterparts.

Starting with the product-wise disaggregation, at least three fourths of the products we consider show ratios (NA/BP over IMTS data) above 95 per cent, both for exports and imports (Fig. 6). On the export side, the ratio tends to be relatively low for pharmaceuticals, refined oil products, textiles (only in the last five years) and transport equipment other than vehicles (only until 2004). On the import side, the products for which NA data tend to be particularly lower than IMTS– in other words, the products for which the correction for processing

[6] Exports of processing services are also recorded, of course.

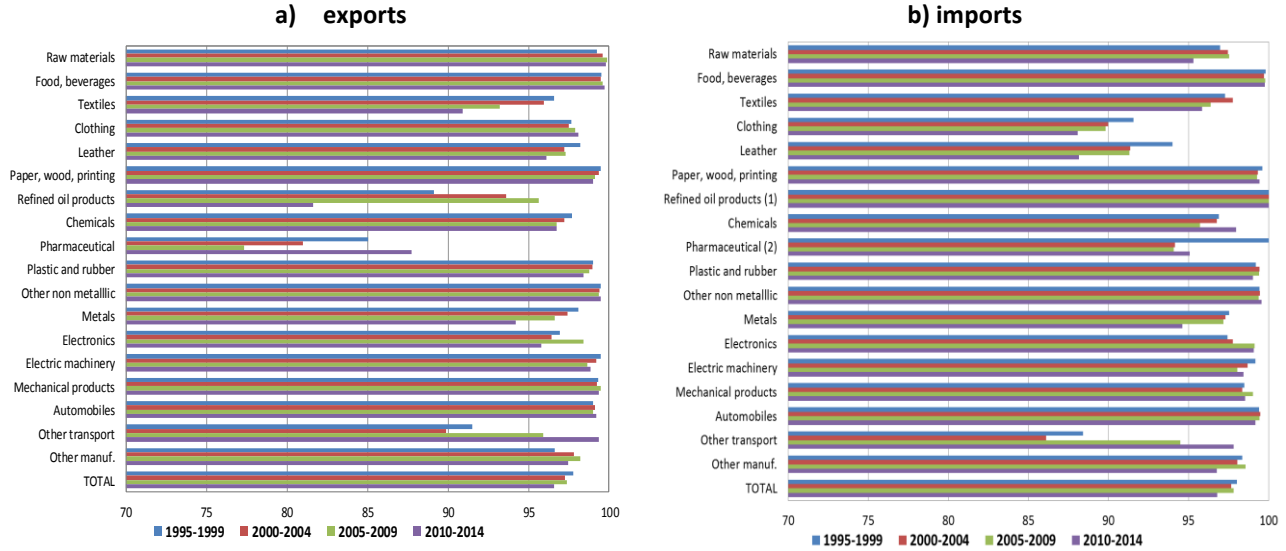
flows is more significant – are clothing, leather products and transport equipment other than vehicles (again only until 2004). Imports of refined oil products and of pharmaceuticals (in the late 1990s) stand out, since the new standards lead to an upward adjustment of purchases from abroad for these manufactures relative to IMTS, as we have just explained.

As for the aggregate dynamics, the effect of ousting flows associated with processing activities is increasing over time (the ratio between NA/BP and IMTS data is decreasing over time for the full set of goods), especially in the latest five-year period.

For exports the result is driven by metals, chemical products, textiles and leather products. Among the main Italian specialization sectors, the ratio for mechanical products, food and beverages, vehicles and apparel tends to be quite stable or slightly increasing over time. On the import side, the result is driven by raw materials, which is by far the set of products with the largest weight, as well as metals. We will further comment on the evolution within individual sectors in the following Section.

Figure 6: Goods trade flows by sector - national accounts and IMTS

(percentage ratio between NA/BP and IMTS data at current prices)



Source: our elaborations on NA/BP and Istat data.

(1) The value in each five-year period (112.7, 115.8, 115.2 and 101.9, respectively) is off the scale. (2) The value in 1995-99 is off the scale (100.5).

Turning to the geographical analysis, Figure 7 traces the ratio of NA/BP data to IMTS for bilateral merchandise trade between Italy and selected trading partners. The ratios are particularly low in the case of Belgium and Luxembourg, Slovenia, a set of Eastern EU countries (Bulgaria, Croatia, Romania) and the aggregate "Albania and former-Yugoslavia" (Albania, Bosnia and Herzegovina, Republic of Serbia, Republic of Kosovo, Montenegro, Republic of Macedonia; EU member states Slovenia and Croatia are excluded). These countries stand out both on the export and the import side, due to two concurrent factors: i) goods involved in processing cross the domestic border twice, in opposite directions; ii) processing mainly involves bilateral, rather than multilateral, transactions; i.e. the predominant case is one where the country that provides the processing service (country B) imports the goods to be processed from the residence-country of their owner (country A) and ships them back to country A.[7] On the import side, Switzerland in the latest five-year interval and Ireland in the 1990s are characterized by percentage ratios greater than 100. The result is mainly driven by refined oil products for

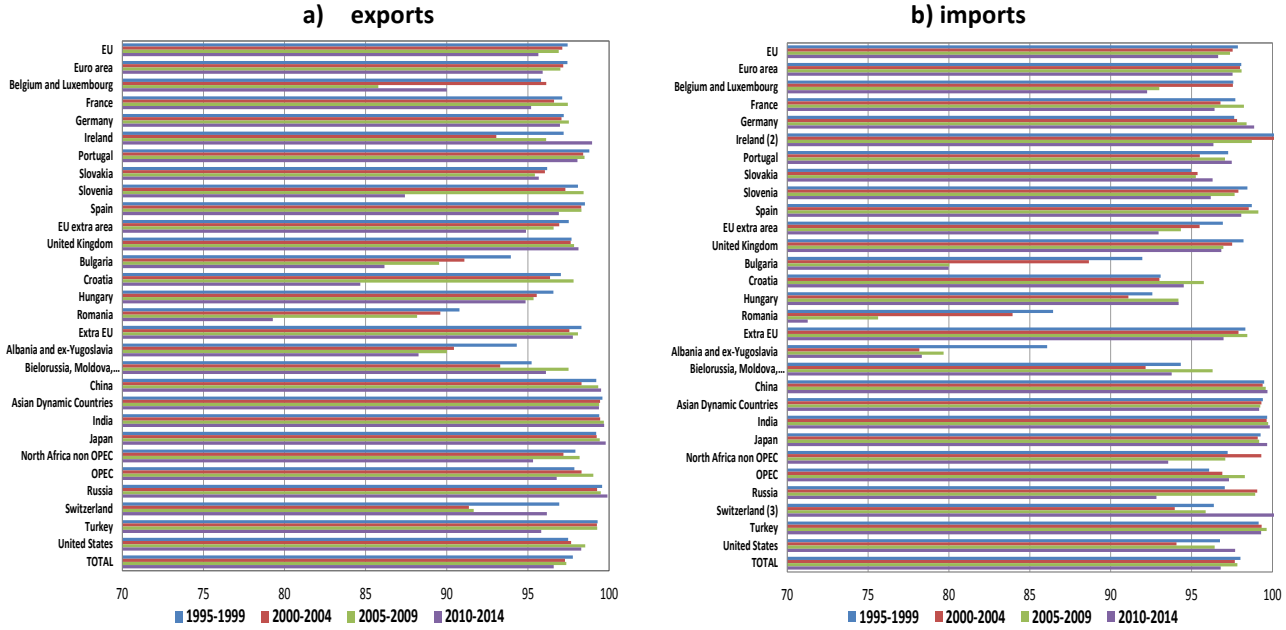
[7] As an example, a multilateral (asymmetric) transaction arises when country B receives the merchandise from country A, supplies the processing service, ships the processed goods to a third country C where they are further processed before being ultimately returned to their owner in country A.

Switzerland, and by pharmaceutical products for Ireland, trough the mechanism of "imputed imports" described above.

As for macro-areas, a general stylized fact emerges from the data: the effect of ousting flows associated with processing activities from IMTS is weaker for extra-EU trade, both on the import and the export side, than for intra-EU trade. Within the EU, the effect is slightly weaker for euro area countries and stronger (especially for imports) for trade with the EU countries outside the eurozone.

Figure 7: Goods trade flows by counterpart country - national accounts and IMTS (1)

(percentage ratio between NA/BP and IMTS data at current prices)



Source: our elaborations on NA/BP and Istat data.

Notes: (1) The total is a weighted average of the EU and the extra-EU components; the former is further broken down between euro area and EU members outside the euro area. The most relevant countries in each of these macro areas are shown separately in the table. Albania and ex-Yugoslavia: excluding the EU members that formerly belonged to Yugoslavia (Slovenia and Croatia). Asian Dynamic Countries: Thailand, Malaysia, Singapore, Korean Republic, Taiwan, Hong Kong. North Africa non OPEC: Morocco, Tunisia, Egypt. (2) The values in 1995-99 and in 2000-04 are off the scale (102.9 and 104.2, respectively). (3) The value in 2010-14 is off the scale (107.1).

3.2 Does the new treatment of processing alter the structure and evolution of goods trade?

So far the impact of processing on the recording of merchandise trade in the NA/BP framework has been assessed by looking at the ratio with the IMTS counterparts. Clearly, for a given trade flow (exports or imports), whenever the ratio for a specific product or partner country is lower (higher) than the average, the share of that product/country in the corresponding overall trade flow is lower (higher) in NA/BP data than in IMTS data.

To assess the impact of the new statistical standards on the structure of Italian merchandise trade and its specialization patterns we compare, for each of the five-year periods covered in our analysis, the sectoral composition of merchandise trade based on the two sets of data (Tab. 3). Differences tend to be very small in magnitude and stable over time, with a few exceptions that we now discuss individually with the further support of Figure 8.[8]

[8] If we compute for each product the absolute difference between its weight in NA/BP data and its weight in IMTS data over the entire time span and consider individual contributions to the mean absolute difference (Tab. A2 in the data appendix), it turns out that half of the overall gap between the two data sources (around 54%) is due to four sectors on the export side (pharmaceuticals, mechanical

Table 3: Sectoral composition of goods trade - differences between NA/BP data and IMTS

(percentage points)

Products:	Exports						Imports					
	Composition in 2010-14, NA/BP data	Differences between NA/BP and IMTS composition					Composition in 2010-14, NA/BP data	Differences between NA/BP and IMTS composition				
		1995-99	2000-04	2005-09	2010-14	Average 1995-2014		1995-99	2000-04	2005-09	2010-14	Average 1995-2014
Raw materials	1.9	0.0	0.0	0.0	0.1	0.0	19.6	-0.1	0.0	-0.1	-0.3	-0.1
Food, beverages	7.0	0.1	0.1	0.1	0.2	0.1	7.6	0.2	0.1	0.1	0.2	0.2
Textiles	2.4	-0.1	-0.1	-0.1	-0.1	-0.1	1.7	0.0	0.0	0.0	0.0	0.0
Clothing	4.6	0.0	0.0	0.0	0.1	0.0	3.0	-0.2	-0.2	-0.3	-0.3	-0.2
Leather	4.3	0.0	0.0	0.0	0.0	0.0	2.1	-0.1	-0.2	-0.1	-0.2	-0.1
Paper, wood, printing	2.1	0.0	0.0	0.0	0.1	0.0	2.6	0.1	0.1	0.0	0.1	0.1
Refined oil products	3.7	-0.1	-0.1	-0.1	-0.7	-0.2	2.9	0.3	0.3	0.3	0.1	0.3
Chemicals	6.6	0.0	0.0	0.0	0.0	0.0	9.4	-0.1	-0.1	-0.2	0.1	-0.1
Pharmaceutical	4.2	-0.3	-0.6	-0.7	-0.4	-0.5	5.1	0.1	-0.1	-0.2	-0.1	-0.1
Plastic and rubber	3.7	0.0	0.1	0.1	0.1	0.1	2.3	0.0	0.0	0.0	0.1	0.0
Other non metalllic	2.5	0.1	0.1	0.1	0.1	0.1	0.9	0.0	0.0	0.0	0.0	0.0
Basic metals	7.2	0.0	0.0	-0.1	-0.3	-0.1	8.0	0.0	0.0	0.0	-0.2	-0.1
Metal products	4.6	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	-0.1	0.0
Electronics	3.2	0.0	0.0	0.0	0.0	0.0	7.4	-0.1	0.0	0.1	0.2	0.1
Electric machinery	5.5	0.1	0.1	0.1	0.1	0.1	3.7	0.0	0.0	0.0	0.1	0.0
Mechanical products	18.7	0.3	0.3	0.4	0.5	0.4	6.3	0.0	0.1	0.1	0.1	0.1
Automobiles	6.9	0.1	0.1	0.1	0.2	0.1	7.6	0.2	0.2	0.2	0.2	0.2
Other transport	3.1	-0.2	-0.3	0.0	0.1	-0.1	1.6	-0.2	-0.3	-0.1	0.0	-0.1
Other manuf.	5.6	-0.1	0.0	0.1	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0
Other goods	2.4	0.0	0.0	0.0	0.1	0.0	3.3	0.0	0.0	0.0	0.0	0.0
TOTAL	**100.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**100.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Source: our elaborations on NA/BP and Istat data.

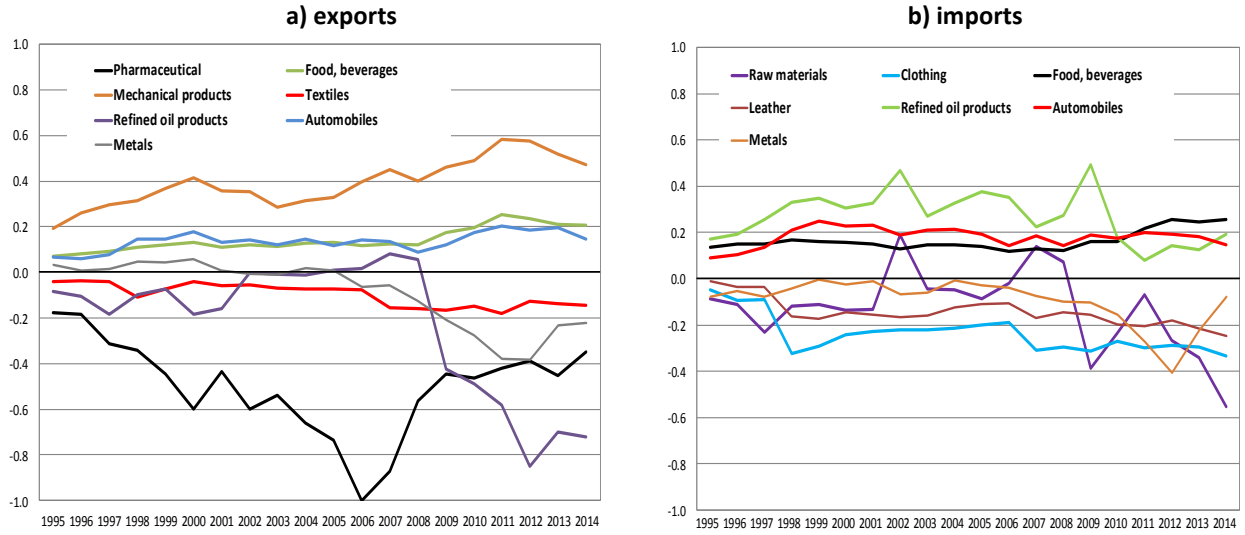
On the export side, according to NA/BP data Italy is slightly more specialized, and increasingly so, in mechanical products, automobiles and food and beverages; the weights tend instead to be slightly lower than their IMTS counterparts for textiles and, only in the latest years, metal products and refined oil products. In absolute terms the largest differences are recorded for mechanical and refined oil products. Exports of pharmaceutical products are worth a short digression in order to comment on their expansion in recent years: the weight of these products is always smaller than in IMTS data and the difference increases in absolute terms (from around 0.2 percentage points in 1995 to one point in 2006), then declines to around 0.4 points in 2014 (Fig. 8a). Several studies conducted at Banca d'Italia have highlighted that pharmaceutical companies have been very dynamic on foreign markets in recent years, with the sector share (based on IMTS) increasing from 3.3 per cent of total exports in 2007 to 5.2 per cent in 2014. According to the new accounting standards the expansion has been even stronger: the share has almost doubled, from 2.4 to 4.9 per cent.

On the import side, the sectoral composition shows a rebalancing, relative to IMTS trade, from raw materials towards refined oil products: as explained in the previous Section, this is the outcome of the new standards recognizing that imported crude oil refined in Italy and subsequently sold in Italy (without leaving the country after processing) is to be recorded as an import of refined oil products. On the contrary, the share of clothing and leather products is lower in NA/BP data, and increasingly so.

products, refined oil, transport equipment other than automobiles) and to five sectors on the import side (refined oil, clothing, automobiles, food and beverage, leather products). Differences tend to be less concentrated along the geographical dimension (Tab. A3 in the data appendix).

Figure 8: Sectoral composition over time - difference between NA/BP data and IMTS

(percentage points)



Source: our elaborations on NA/BP and Istat data.

Next, we consider the geographical composition of merchandise trade; differences between the two data sources tend to be negligible in this respect in all of our five-year periods (Tab. A1 in the data appendix). On the export side, the weight of the EU is slightly smaller in NA/BP data, especially owing to Belgium. On the import side, NA/BOP data show a slightly larger weight of Italian purchases coming from the euro area, almost compensated by a smaller weight of EU countries outside the Eurozone.

Summing up, in moving from IMTS to NA/BP data, the structural composition of Italian trade flows changes only modestly, slightly more along the sectoral dimension. As for the interpretation of aggregate trade flows on the basis of IMTS disaggregated data, our findings hence largely confirm both the analysis that was conducted in the past and the meaningfulness of continuing using IMTS for interpreting the trade flows compiled according to the new statistical standards. Specifically, along the geographical dimension the two sets of data significantly differ only for flows associated with small counterpart countries that hardly affect aggregate developments. Along the sectoral dimension, IMTS remain an excellent proxy for the composition of NA/BP data with the exception of a few specific sectors: pharmaceutical and refined oil products on the export side; leather products, apparel and refined oil products on the import side.

4.Trade in processing services

Italy is overall a net exporter of processing services, as anticipated in Section 2; the degree of heterogeneity along the sectoral, geographic and temporal dimension is however rather significant.

Processing services turn out to be highly concentrated across sectors, both on the export and on the import side (Tab. 4). Considering the average of the most recent five-year period, around two thirds of the flows were accounted for by four sectors only (pharmaceutical, refined oil products, metal products and basic metals on the export side; clothing, leather, metal products and transport vehicles other than automobiles for imports).

The sectoral composition changed rather significantly over time, with marked trends in a number of specific industries. In the case of exports, the weight of the pharmaceutical sector virtually doubled in the time horizon covered by our data (from 16.2 per cent in the period 1995-99 to 27.3 per cent in 2010-14), that of refined oil products increased almost four-fold (from 5.4 to 19.5 per cent). In turn, sectors such as other transport vehicles, mechanical products, electronics, chemicals, textiles and clothing underwent a marked decrease of their share. As for imports, clothing and leather almost doubled and metal products tripled their share in total flows. The weight of electronics and of transport equipment other than vehicles progressively and significantly shrunk.

Table 4: Sectoral composition of exports and imports of processing services

(percentages)

	Exports					Imports				
	1995-99	2000-04	2005-09	2010-14	**mean**	1995-99	2000-04	2005-09	2010-14	**mean**
Raw materials	0	0	0	0	0	0	0	0	0	0
Food, beverages	3.4	2.1	1.5	1.7	2.2	1.8	1.1	1.2	1.9	1.5
Textiles	6	4	2.8	1.8	3.6	3.1	2.9	5.6	5	4.2
Clothing	5.2	2.3	2.2	2.3	3	14.4	14.8	20.3	25.3	18.7
Leather	1.7	1.2	1.7	1.1	1.4	7.8	9.4	13	16.9	11.8
Paper, wood, printing	3	2.5	1.9	2.7	2.5	0.9	0.6	1.7	1.6	1.2
Refined oil products	5.4	7.7	7.1	19.5	9.9	0	0	0.4	0.1	0.1
Chemicals	11	15.2	9.4	6.6	10.5	2.7	2	2.2	0.9	1.9
Pharmaceutical	16.2	22.2	31.8	27.3	24.4	5.4	6.3	4.5	2.4	4.7
Plastic and rubber	1.1	0.5	1.3	1.4	1.1	0.8	0.9	1.7	1.6	1.3
Other non metalllic	1.3	1.5	1.7	2.2	1.7	0.5	0.4	0.7	0.8	0.6
Basic metals	2.9	2.4	4.7	9.8	5	6.5	6.2	5.1	4.2	5.5
Metal products	3.5	4	7.8	9.2	6.1	4	3.9	8.7	14.1	7.7
Electronics	9.1	8.1	7.2	2.9	6.8	21.7	10	6.3	3.4	10.4
Electric machinery	1.2	0.8	1.5	0.9	1.1	2	2.8	4.7	3.5	3.2
Mechanical products	5	3.8	3.7	2.6	3.7	8.6	6.8	6.9	2.4	6.2
Automobiles	3.2	2.9	3.5	1.8	2.9	2	2.1	3	5.3	3.1
Other transport	11.8	15.5	8.2	3.8	9.8	15.1	27.1	10.6	5.5	14.6
Other manuf.	8.9	3.3	2.2	2.1	4.1	2.6	2.6	3.3	2.9	2.9
Other goods	0	0	0	0.5	0.1	0	0	0	2	0.5
TOTAL	**100**	**100**	**100**	**100**		100	100	100	100	100

Source: our elaborations on NA/BP data.

Italian trade of processing services is very concentrated also by geographical counterpart (Tab. 5). In the period 2010-14 Switzerland and Germany accounted together for almost half of total export flows (respectively 33.4 and 14.7 per cent); another quarter was concentrated in France, Ireland and the United Kingdom (slightly less than 8 per cent each). Focusing on EU countries, which in 2010-14 represented an overall weight of 55.1 per cent, the relevance of France decreased substantially, almost halving in the time horizon covered by our data, whereas that of Germany and of the UK declined only marginally. Outside the EU, the Swiss market recorded an impressive expansion as a destination of processing services, with a weight rising from 3.5 per cent in 1995-99 to 33.4 per cent in 2010-14. This result could be biased by the scarcity of specific information prior to 2010: processing services to Switzerland might in fact be underestimated before that date.

EU markets account also for the largest fraction of processing imports (on average 68.7 per cent in 2010-14). In this case, however, the relative importance of euro-area versus EU countries outside the Eurozone is reversed: the weight of the latter is almost four times as large as compared to exports and it doubled over time, due to the import flows from Eastern EU markets and in particular from Romania (whose weight rose from 7.8 to 23.7 per cent). As for non-EU countries, in the most recent five-year period they explained slightly more than 30 per cent of Italian imports, one third of which originating from Albania and the former Yugoslavian countries, which recorded since the mid-nineties an impressive growth as providers of processing services for our national producers.

Table 5: Geographical composition of exports and imports of processing services (1)
(percentages)

	Exports					Imports				
	1995-99	2000-04	2005-09	2010-14	mean	1995-99	2000-04	2005-09	2010-14	mean
EU	71.2	66.7	69.9	55.1	65.7	76.8	76.6	73.4	68.7	73.9
Euro area	60.7	57.1	58.2	44.1	55	54.2	50.9	32.5	27.6	41.3
Belgium and Luxembourg	4.1	4.1	10.8	5.2	6	2.2	2.9	1	1.1	1.8
France	15.8	11.7	10.2	7.5	11.3	18	18	5.5	7	12.1
Germany	19.9	17	18.5	14.7	17.5	17.9	17.6	14.5	11.3	15.3
Ireland	5.8	12.1	2.9	7.5	7.1	0.3	1.2	1.2	0.4	0.8
Portugal	0.6	0.4	0.4	0.5	0.5	1.2	0.8	1	0.7	0.9
Slovakia	0	0.1	0.4	0.2	0.2	1.1	1.2	2.5	1.5	1.6
Slovenia	0.2	0.2	0.4	0.3	0.3	0.5	0.6	1.4	0.8	0.8
Spain	2.8	2.6	3.4	1.3	2.5	3.5	3.4	1.9	1.6	2.6
EU extra area	10.5	9.6	11.7	11.1	10.7	22.6	25.8	40.9	41.1	32.6
United Kingdom	8.4	7.7	5.8	7.9	7.5	5.7	5.4	2.5	5.3	4.7
Bulgaria	0	0.1	0.6	0.1	0.2	1.7	2	4.5	4.1	3.1
Croatia	0.1	0.1	0.1	0.2	0.1	1.4	1.2	2.2	1.5	1.6
Hungary	0.1	0.2	0.6	0.2	0.3	3.6	3.7	4.6	2.6	3.6
Romania	0.1	0.1	1.6	0.5	0.6	7.8	11.1	21.7	23.7	16.1
Extra EU	28.8	33.3	30.1	44.9	34.3	23.2	23.4	26.6	31.3	26.1
Albania and ex-Yugoslavia	0.1	0	0.1	0.1	0.1	3.1	4.7	6.9	10.9	6.4
Bielor. Moldova, Ucraina	0	0	0.1	0.1	0.1	1.1	2.2	1.7	2	1.7
China	0.1	1.3	0.4	0.6	0.6	0.5	1.1	2.2	2.2	1.5
Asian Dynamic Countries	0.5	0.4	0.7	0.6	0.6	1.2	0.4	1.5	2.2	1.3
India	0.1	0.1	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1
Japan	0.6	0.4	0.3	0.3	0.4	0.2	0.6	1.4	0.5	0.7
North Africa non OPEC	0.7	0.8	0.3	0.4	0.5	0.7	0.8	2.6	3.4	1.9
OPEC	1.7	1.3	1.1	1	1.3	0.3	0.5	0.5	0.1	0.3
Russia	0.1	0.1	0.2	0.4	0.2	0.3	0.3	0.2	0	0.2
Switzerland	3.5	7.3	14.1	33.4	14.6	3.3	3.4	1.7	1.9	2.6
Turkey	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.3	0.3	0.2
United States	10.8	10.3	4.8	5	7.7	8.3	6.5	5.4	3.5	5.9
TOTAL	100	100	100	100	100	100	100	100	100	100

Source: our elaborations on NA/BP data.
Notes: (1) The total is a weighted average of the EU and the extra-EU components; the former is further broken down between euro area and EU members outside the euro area. The most relevant countries in each of these macro areas are shown separately in the table. Albania and ex-Yugoslavia: excluding the EU members that formerly belonged to Yugoslavia (Slovenia and Croatia); Asian Dynamic Countries: Thailand, Malaysia, Singapore, Korean Republic, Taiwan, Hong Kong; North Africa non OPEC: Morocco, Tunisia, Egypt.

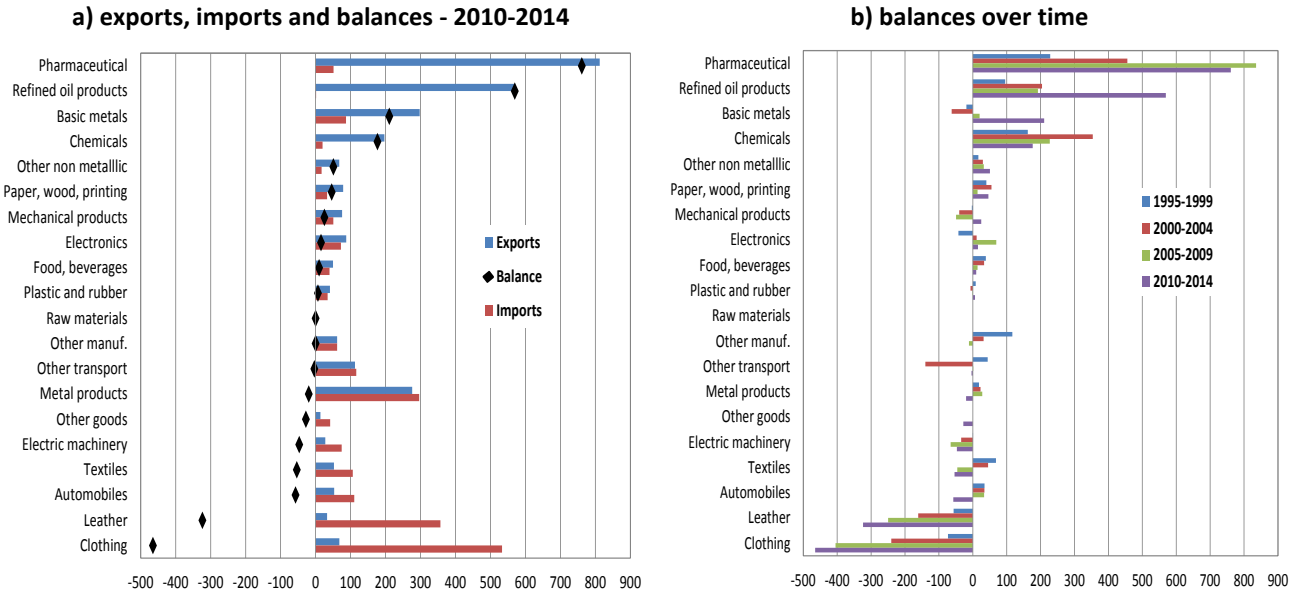
The general picture of Italian international transactions of processing services can be further enriched by looking at export-import balances, also in this case along the sectoral and the geographical dimensions.

The overall positive balance recorded by our country in the exchange of processing services over time is driven almost exclusively by three sectors: pharmaceutical, refined oil products and chemicals. In the period 2010-14 the largest positive balance by far was recorded by the pharmaceutical industry (about €750 million annually on average) as a result of very large flows on the export side and very low ones on the import side (Fig. 9a), the surplus increased substantially since the mid-nineties, almost fourfold as of the last decade of the time horizon (Fig. 9b). Italian firms are also net exporters of processing services in the refined oil industry (imports are virtually nil), with an annual balance that increased fivefold since the mid-nineties, also thanks to the surge in oil prices, reaching an annual average of around €500 million. By contrast, the balance related to the processing of chemical products set up on a downward trend after the substantial growth in the first half of the 2000s, returning in the last five years to the levels of the early nineties (around an annual average of almost €200 million).

On the other hand, in 2010-14 Italian firms were net importers of processing services in the production of electrical machinery, textiles, automobiles, leather and clothing. In these two latter sectors the negative balance expanded very significantly over time. In the automobiles and textiles industries, instead, the balance was positive in the first part of the time horizon and it turned into negative territory only recently.

Finally, metal products and transport equipment other than vehicles are also interesting cases, as they are characterized by small deficits which hide relatively large flows both on the export and on the import side.

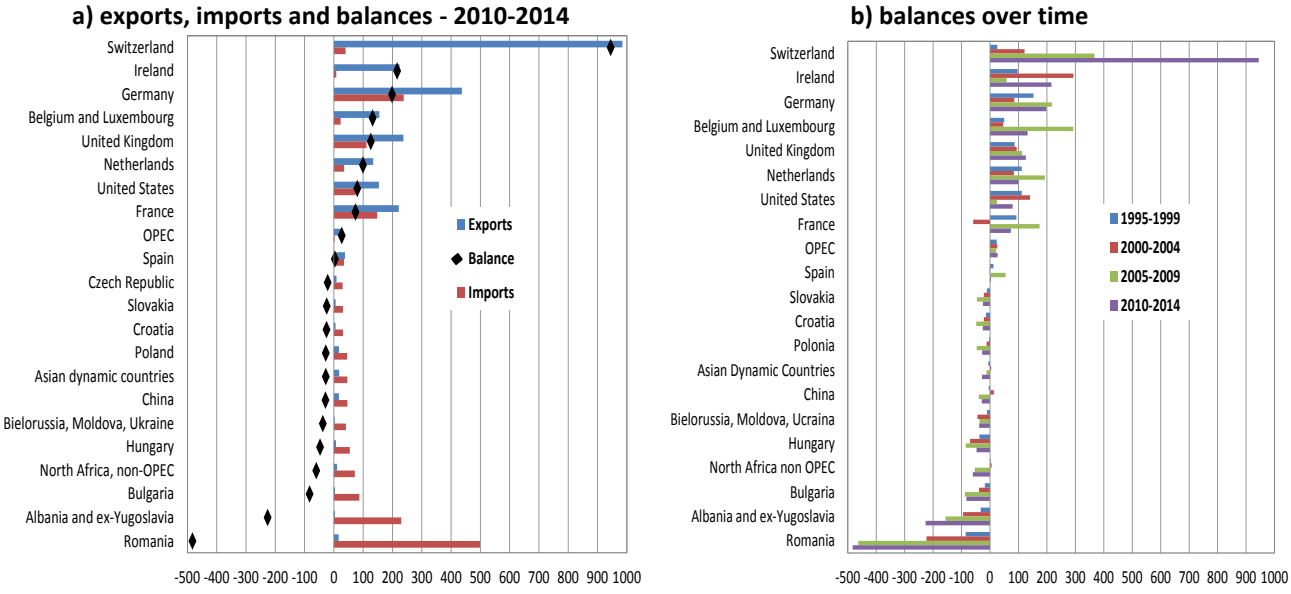
Figure 9: Processing services by sector
(yearly averages at current prices; EUR millions)



Source: our elaborations on NA/BP data.

As for the geographical breakdown, the positive balance is accounted for by few partners (Figg. 10a and 10b).

Figure 10: Processing services by counterpart country
(yearly averages at current prices; EUR millions)



Source: our elaborations on NA/BP data.

The first two partner countries are Switzerland, with a balance that in the period under exam rose from almost zero to more than €800 million annually[9], and Ireland; for both countries this is the result of high export flows of Italian processing services in the virtual absence of flows in the opposite direction. Germany, Belgium and

[9] Although exports of processing services to Switzerland might be underestimated before 2010, as already mentioned.

Luxembourg and the UK follow in order of importance. The bilateral balance *vis-à-vis* the two largest euro area countries is the result of relatively significant flows in both directions, without a defined trend over time, testifying to the interconnectedness of the three economies. The balance *vis-à-vis* the United States, which was positive until a decade ago, became almost negligible since 2005.

Large negative balances are instead recorded with Romania, Albania and the other former Yugoslavian countries; in all cases this is due to large and increasing import flows, causing an almost five-fold widening of the balances.

What type of processing services do Italian firms exchange with individual countries? Table 6a reportsthe ranking of the three products that generated the largest flows, separately for exports and imports, with each of the main trading partners. It turns out that exports to Switzerland are concentrated in refined oil products, pharmaceutical goods and basic metals. Pharmaceuticals are in value terms the main product for which Italian firms perform processing services for Germany, the UK, Ireland, Belgium, Luxembourg and the Netherlands. On the other hand, imports of processing services from Romania, Albania, Bulgaria and North African countries refer primarily to clothing and leather products.

Both outward and inward flows with Germany concern primarily pharmaceuticals and metal products; in the case of France they are instead concentrated in metal products and means of transport other than vehicles.

Table 6: Exports and imports of processing services in the period 2010-2014

a) main 3 products by country

Exports	Product 1	Product 2	Product 3
Switzerland	Refined oil products	Pharmaceutical	Basic metals
Germany	Pharmaceutical	Metal products	Chemicals
United Kingdom	Pharmaceutical	Paper, wood, printing	Metal products
France	Metal products	Clothing	Other transport
Ireland	Pharmaceutical	Mechanical products	Other goods
United States	Basic metals	Other transport	Pharmaceutical
Belgium and Luxembourg	Pharmaceutical	Other non metalllic	Food, beverages
Netherlands	Pharmaceutical	Chemicals	Electronics
Imports	**Product 1**	**Product 2**	**Product 3**
Romania	Clothing	Leather	Electric machinery
Albania and ex-Yugoslavia	Leather	Clothing	Metal products
Germany	Metal products	Basic metals	Pharmaceutical
France	Other transport	Metal products	Basic metals
United Kingdom	Metal products	Other transport	Mechanical products
Bulgaria	Clothing	Leather	Textiles
United States	Automobiles	Other transport	Electronics
North Africa, non-OPEC	Clothing	Leather	Electric machinery

b) main 3 countries by product

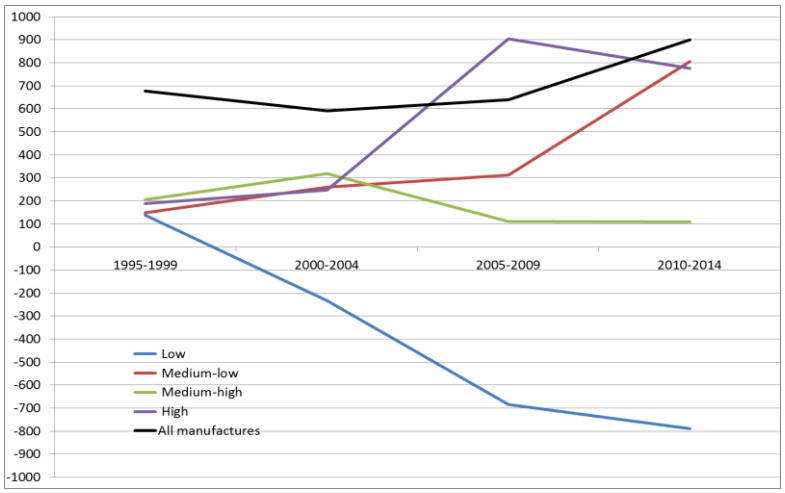
Exports	Country 1	Country 2	Country 3
Pharmaceutical	Switzerland	Ireland	Germany
Refined oil products	Switzerland	United Kingdom	France
Basic metals	Switzerland	United States	Germany
Metal products	Germany	France	United Kingdom
Chemicals	Germany	Netherlands	United Kingdom
Other transport	France	United States	United Kingdom
Imports	**Country 1**	**Country 2**	**Country 3**
Clothing	Romania	Albania and ex-Yugoslavia	North Africa, non-OPEC
Leather	Romania	Albania and ex-Yugoslavia	Bulgaria
Metal products	Germany	United Kingdom	France
Other transport	France	Germany	United Kingdom
Automobiles	United States	Germany	Japan
Textiles	Romania	Hungary	China

Source: our elaborations on NA/BP data.

By and large, we can conclude on the basis of the above evidence that the Italian structural surplus in processing services is driven by imports from low-wage countries in "low-value-added" sectors and by exports to developed countries in "high-value-added" ones. More rigorously, according to Eurostat definition of technological intensity within manufacturing (Fig. 11), Italy is in fact an importer in low-tech productions (apparel, leather products and textiles) and an exporter in high-tech productions (mostly pharmaceutical products); the balances in these two categories tend to exactly compensate each other, leaving the overall balance of processing services to mirror the surplus in medium-tech - and scale intensive – sectors (chemicals, refined oil products, basic metals).

Figure 11: Processing services - yearly balances by technological intensity

(at current prices; EUR millions)



Source: our elaborations on NA/BP data.

Notes: manufacturing goods at the 3-digit level of the CPA classification are binned into technological intensity levels by implementing the correspondence table in use at Eurostat. The overall balance on processing services is overwhelmingly concentrated, for Italy, in the manufacturing sectors.

5.Conclusions

The adoption of the new statistical standards ESA 2010 and BPM6 has introduced a wedge between trade in goods data as measured by international merchandise trade statistics (IMTS) on the one side, and by national accounts and the balance of payments (NA/BP) on the other side. Such difference is mainly due to the new treatment of goods sent abroad for processing: flows related to products that cross the frontier for being processed without changing ownership are now excluded from transactions in goods and recorded, on a net basis, as exports or imports of processing services. While the new approach has almost no impact on the overall balance, and hence on GDP growth, gross flows as recorded in NA/BP statistics are now between 2 and almost 4 percent lower than their IMTS counterparts.

The purpose of the analysis presented in this paper is two-fold. First, we investigate whether the geo-sectoral breakdown available in IMTS for Italy remains a valid instrument for interpreting aggregate developments as they contribute to GDP in national accounts. Second, we look in detail, for the first time, into processing services in order to describe how Italian firms took advantage of this channel, between 1995 and 2014, for exploiting the opportunities of global value chains.

Our findings largely validate both the analysis that was conducted in the past based on the previous statistical standards and the meaningfulness of continuing using IMTS in interpreting the new NA/BP aggregates. The geographical structure of IMTS significantly differs from NA/BP data only for flows associated with small counterpart countries that hardly affect aggregate developments. As for the sectoral composition, IMTS are an excellent approximation of NA/BP data with the exception of a few specific sectors: pharmaceutical and refined oil products on the export side; leather products, apparel and refined oil products on the import side.

Italy is historically a net exporter of processing services, although the surplus is modest, around €1 billion per year on average in the last five-year period. Exports to euro-area member states and the UK tend to exceed imports, while trade with Eastern-European EU members (in particular Romania and Bulgaria) tend to generate a deficit. Also flows to and from countries outside the EU tend to be in surplus, especially thanks to the contribution of Switzerland and the US, and notwithstanding the deficit with Albania and former-Yugoslavian countries outside the EU.

Processing services are highly concentrated, both on the export and on the import side, along the geographical dimension as well as the sectoral one. In 2010-14 Switzerland and Germany accounted for almost half of total export flows; on the import side, Romania and Germany for more than one third. Around two thirds of the flows in 2010-14 were accounted for by just four sectors: pharmaceutical, refined oil products, metal products and basic metals on the export side, clothing, leather, metal products and transport vehicles other than automobiles on the import side.

Overall, according to Eurostat definition of technological intensity within manufacturing, Italy is an importer of processing services in low-tech productions (apparel, leather products and textiles) and an exporter in high-tech productions (mostly pharmaceutical products); the deficit in the former tends to exactly compensate the surplus in the latter; the overall balance then mirrors the surplus in medium-tech - and scale intensive – sectors (chemicals and refined oil products).

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Data appendix

Table A1: Geographical composition of goods trade - differences between NA/BP and IMTS (1)

(percentage points)

Coutries/areas:	Exports						Imports					
	Composition in 2010-14, NA/BP data	Differences between NA/BP and IMTS composition					Composition in 2010-14, NA/BP data	Differences between NA/BP and IMTS composition				
		1995-99	2000-04	2005-09	2010-14	Average 1995-2014		1995-99	2000-04	2005-09	2010-14	Average 1995-2014
EU	**54.9**	**-0.2**	**-0.1**	**-0.3**	**-0.5**	**-0.3**	**55.0**	**-0.1**	**-0.1**	**-0.3**	**-0.1**	**-0.1**
Euro area	**41.3**	**-0.2**	**-0.1**	**-0.2**	**-0.3**	**-0.2**	**44.6**	**0.0**	**0.2**	**0.1**	**0.3**	**0.2**
Belgium and Luxembourg	2.7	-0.1	0.0	-0.4	-0.2	-0.2	4.0	0.0	0.0	-0.2	-0.2	-0.1
France	11.0	-0.1	-0.1	0.0	-0.2	-0.1	8.5	0.0	-0.1	0.0	0.0	0.0
Germany	12.8	-0.1	0.0	0.0	0.0	0.0	15.6	-0.1	0.0	0.1	0.3	0.1
Ireland	0.3	0.0	0.0	0.0	0.0	0.0	0.8	0.1	0.1	0.0	0.0	0.0
Portugal	0.9	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Slovakia	0.6	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0
Slovenia	0.9	0.0	0.0	0.0	-0.1	0.0	0.7	0.0	0.0	0.0	0.0	0.0
Spain	5.0	0.0	0.1	0.1	0.0	0.0	4.6	0.0	0.0	0.1	0.1	0.0
EU extra area	**13.7**	**0.0**	**-0.1**	**-0.1**	**-0.2**	**-0.1**	**10.3**	**-0.1**	**-0.3**	**-0.4**	**-0.4**	**-0.3**
United Kingdom	5.1	0.0	0.0	0.0	0.1	0.0	2.7	0.0	0.0	0.0	0.0	0.0
Bulgaria	0.4	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	-0.1	-0.1	-0.1
Croatia	0.5	0.0	0.0	0.0	-0.1	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Hungary	0.9	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Romania	1.3	-0.1	-0.1	-0.1	-0.3	-0.1	1.0	-0.1	-0.2	-0.3	-0.4	-0.2
Extra EU	**45.1**	**0.2**	**0.1**	**0.3**	**0.5**	**0.3**	**45.0**	**0.1**	**0.1**	**0.3**	**0.1**	**0.1**
Albania and ex-Yugoslavia	0.8	0.0	0.0	-0.1	-0.1	-0.1	0.6	0.0	-0.1	-0.1	-0.1	-0.1
Bielorussia, Moldova, Ukrai	0.6	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0
China	2.6	0.0	0.0	0.0	0.1	0.0	7.3	0.0	0.1	0.1	0.2	0.1
Asian dynamic countries	3.5	0.1	0.1	0.1	0.1	0.1	1.9	0.0	0.0	0.0	0.0	0.0
India	0.9	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0
Japan	1.4	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0
North Africa, non-OPEC	2.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0
OPEC	5.5	0.0	0.0	0.1	0.0	0.0	8.6	-0.1	-0.1	0.1	0.1	0.0
Russia	2.6	0.0	0.0	0.1	0.1	0.0	4.4	0.0	0.0	0.0	-0.2	0.0
Switzerland	5.2	0.0	-0.2	-0.2	0.0	-0.1	3.2	-0.1	-0.1	-0.1	0.3	0.0
Turkey	2.5	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0
United States	6.8	0.0	0.0	0.1	0.1	0.1	3.3	-0.1	-0.2	0.0	0.0	-0.1
TOTAL	**100.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**100.0**	0.0	0.0	0.0	0.0	0.0

Source: our elaborations on Istat and NA/BP data.

Notes: (1) The total is a weighted average of the EU and the extra-EU components; the former is further broken down between euro area and EU members outside the euro area. The most relevant countries in each of these macro areas are shown separately in the table. Albania and ex-Yugoslavia: excluding the EU members that formerly belonged to Yugoslavia (Slovenia and Croatia); Asian Dynamic Countries: Thailand, Malaysia, Singapore, Korean Republic, Taiwan, Hong Kong; North Africa non OPEC: Morocco, Tunisia, Egypt.

Table A2: Sectoral composition of goods trade - absolute differences between NA/BP and IMTS

(percentage points; mean absolute differences over the 1995-2014 period)

Exports				Imports			
Product:	Mean absolute difference	Contribution to total	Cumulated contribution to total	Product:	Mean absolute difference	Contribution to total	Cumulated contribution to total
Pharmaceutical	0.50	23.94	23.94	Refined oil products	0.27	14.94	14.94
Mechanical products	0.39	18.79	42.72	Clothing	0.24	13.06	27.99
Refined oil products	0.23	10.80	53.53	Automobiles	0.18	9.91	37.91
Food, beverages	0.14	6.83	60.35	Food, beverages	0.16	9.05	46.96
Automobiles	0.14	6.55	66.90	Leather	0.15	7.98	54.94
Electric machinery	0.11	5.22	72.12	Other transport	0.14	7.52	62.46
Other transport	0.10	5.03	77.15	Raw materials	0.13	7.08	69.54
Textiles	0.10	4.71	81.86	Pharmaceutical	0.08	4.32	73.86
Other non metalllic	0.07	3.24	85.10	Mechanical products	0.07	4.07	77.93
Basic metals	0.06	3.00	88.10	Chemicals	0.07	4.02	81.95
Plastic and rubber	0.06	2.78	90.88	Basic metals	0.07	3.66	85.61
Raw materials	0.04	2.13	93.02	Paper, wood, printing	0.06	3.21	88.82
Paper, wood, printing	0.04	2.10	95.12	Electronics	0.06	3.07	91.89
Clothing	0.02	1.20	96.32	Plastic and rubber	0.04	2.05	93.93
Metal products	0.02	1.13	97.45	Electric machinery	0.04	1.98	95.91
Electronics	0.02	0.94	98.39	Metal products	0.03	1.55	97.46
Other manuf.	0.01	0.65	99.04	Other non metalllic	0.02	1.10	98.56
Other goods	0.01	0.52	99.56	Textiles	0.01	0.81	99.38
Chemicals	0.01	0.42	99.98	Other manuf.	0.01	0.52	99.90
Leather	0.00	0.02	100.00	Other goods	0.00	0.10	100.00
TOTAL	2.09	100.00		TOTAL	1.82	100.00	

Source: our elaborations on Istat and NA/BP data.

Table A3: Geographical composition of goods trade - absolute differences between NA/BP and IMTS (1)

(percentage points; mean absolute differences over the 1995-2014 period)

Exports				Imports			
Countries:	Mean absolute difference	Percentage contribution to total	Cumulated contribution to total	Countries:	Mean absolute difference	Percentage contribution to total	Cumulated contribution to total
Belgium and Luxembourg	0.16	10.2	10.2	Rest of the world	0.28	13.5	13.5
Rest of the world	0.16	10.1	20.3	Romania	0.23	11.3	24.8
Romania	0.15	9.3	29.6	Switzerland	0.16	7.6	32.4
Switzerland	0.13	8.2	37.9	Germany	0.14	6.6	39.0
France	0.09	5.6	43.5	Belgium and Luxembourg	0.13	6.2	45.2
United States	0.08	5.0	48.5	Netherlands	0.11	5.5	50.7
Asian dynamic countries	0.08	4.9	53.4	OPEC	0.11	5.3	56.0
Germany	0.07	4.1	57.5	China	0.10	4.9	60.9
Spain	0.05	3.4	60.9	Albania and ex-Yugoslavia	0.09	4.5	65.4
Albania and ex-Yugoslavia	0.05	3.2	64.1	Russia	0.08	4.0	69.4
OPEC	0.05	3.1	67.3	United States	0.08	3.8	73.1
Russia	0.05	3.0	70.2	France	0.07	3.2	76.4
United Kingdom	0.04	2.7	72.9	Bulgaria	0.05	2.6	79.0
China	0.04	2.4	75.3	Spain	0.05	2.3	81.3
Turkey	0.04	2.3	77.6	Ireland	0.04	2.2	83.4
Japan	0.03	2.1	79.7	Asian dynamic countries	0.04	1.9	85.3
Slovenia	0.03	1.9	81.7	Hungary	0.04	1.8	87.1
Poland	0.03	1.9	83.6	Japan	0.03	1.3	88.4
Bulgaria	0.03	1.8	85.4	Turkey	0.02	1.1	89.6
Croatia	0.02	1.6	87.0	North Africa, non-OPEC	0.02	1.1	90.7
Netherlands	0.02	1.4	88.4	United Kingdom	0.02	1.1	91.8
Greece	0.02	1.3	89.7	Austria	0.02	1.0	92.8
Hungary	0.02	1.0	90.7	India	0.02	0.9	93.7
India	0.02	1.0	91.7	Sweden	0.02	0.9	94.6
North Africa, non-OPEC	0.01	1.0	92.7	Bielorussia, Moldova, Ukraine	0.02	0.9	95.5
Austria	0.01	0.9	93.6	Croatia	0.01	0.6	96.2
Ireland	0.01	0.9	94.5	Denmark	0.01	0.6	96.8
Denmark	0.01	0.9	95.3	Poland	0.01	0.5	97.3
Portugal	0.01	0.9	96.2	Slovakia	0.01	0.5	97.8
Sweden	0.01	0.8	97.0	Finland	0.01	0.5	98.3
Finland	0.01	0.6	97.6	Malta	0.01	0.4	98.7
Bielorussia, Moldova, Ukraine	0.01	0.5	98.1	Greece	0.01	0.3	99.0
Czech Republic	0.01	0.4	98.5	Czech Republic	0.01	0.3	99.3
Slovakia	0.01	0.4	98.9	Portugal	0.01	0.3	99.6
Malta	0.01	0.3	99.3	Slovenia	0.00	0.2	99.7
Cyprus	0.00	0.2	99.5	Non allocated UE	0.00	0.1	99.8
Lituania	0.00	0.2	99.7	Lituania	0.00	0.1	99.9
Non allocated UE	0.00	0.1	99.8	Latvia	0.00	0.1	100.0
Estonia	0.00	0.1	99.9	Cyprus	0.00	0.0	100.0
Latvia	0.00	0.1	100.0	Estonia	0.00	0.0	100.0
TOTAL	**1.58**	**100.0**		**TOTAL**	**2.05**	**100.0**	

Source: our elaborations on Istat and NA/BP data.

Notes: (1) Albania and ex-Yugoslavia: excluding the EU members that formerly belonged to Yugoslavia (Slovenia and Croatia); Asian Dynamic Countries: Thailand, Malaysia, Singapore, Korean Republic, Taiwan, Hong Kong; North Africa non OPEC: Morocco, Tunisia, Egypt. The area "Rest of the world" includes all countries not shown in the table.

Methodological appendix

According to the new accounting standards (ESA 2010 and BPM6) imports and exports of goods are to be registered only when a change of ownership occurs, so that goods sent abroad for processing without a change of ownership are no longer recorded. Such flows are now considered, on a net basis, as exports or imports of processing services. The implementation of the new definitions requires two distinct operations: a) an estimation of the value of processing services; b) an adjustment to IMTS in order to remove the flows of goods crossing the border for or after processing. This appendix sketches the related methodology.

The main statistical source for carrying out these two operations is represented by IMTS broken down by nature of transaction (NoT), which allow to differentiate between transactions involving a transfer of ownership, operations in view of a processing activity and operations following a processing activity. Transactions related to a processing activity are further broken down depending on: a) whether the good is sent for processing from the country of ownership and after processing returns to the country of ownership (symmetric flows), or b) the good is sent from the country of ownership but after processing does not return to the country of ownership or the good returns to the country of ownership but it was not sent from the country of ownership (asymmetric flows).

NoT data are more detailed for flows to and from countries inside the EU (Intrastat goods, IG hereafter) than outside (Extrastat), and in some cases are deemed not to be of a sufficient quality. IMTS have then been supplemented with further information arising from: a) an administrative source available since 2010 collecting trade in services inside the EU (Intrastat Services, IS hereafter); b) the quantity of crude oil processed in Italian refineries on behalf of non-resident owners. The different availability of sources between Intra-EU and Extra-EU transactions suggested to differentiate the methods used for estimating goods for processing, as explained below.

Intra-EU

After linking IS and IG data at a company level, IG observations have been classified in three groups and for each of them a different correction procedure has been applied, as explained below.

Group 1: Coherence between IS and IG records; symmetric flows for processing - This is the simplest case: the merchandise flows have been removed from imports and exports of goods, and the processing fee has been included in services as recorded in IS.

Group 2 Coherence between IS and IG records; asymmetric flows for processing - As before, the processing fee has been included in services as recorded in IS. As for the adjustments that need to be done on IMTS, a distinction is needed between flows associated with exports of processing services (inward processing) and imports of processing services (outward processing).

For inward processing, within this group we observe either a flow of imports of goods for processing without a subsequent flow of exports after processing, or a flow of exports after processing without a preceding flow of imports of goods for processing. In the first case, the goods are not shipped back to the foreign owner after processing but are sold in Italy: they are recorded as imports in Italian NA/BP data and their value is estimated as the sum of the value of the imported goods for processing (as recorded in IG)and the processing fee received (as reported in IS). In the second case the goods to be processed were not sent to Italy from abroad but were purchased by the non-resident owner from another Italian firm, which should be counted as Italian exports: their value is estimated by subtracting the value of the processing service from the value of the goods after processing, as recorded under temporary exports in IG.

For outward processing, within this group we observe either a flow of exports of goods for processing without a subsequent flow of imports after processing, or a flow of imports after processing without a preceding flow of exports of goods for processing. In the first case, after being processed abroad, the goods do not return to Italy but are sold in the processing (or in a third) country: their value is recorded as exports by Italian NA/BP data and it is estimated as the sum of the value of the initial goods for processing (as recorded in IG) and the processing fee paid to the foreign processor (as reported in IS). In the second case the goods to be processed were not sent to the processing country from Italy but were purchased by the Italian owner directly abroad, which should be counted as Italian imports: their value is estimated as the difference between the value of the goods after processing (as recorded in IG) and the processing fee paid to the foreign processor (as reported in IS).

As already noted in the main text, the nature of the goods (as detected by the product classifications) can change for effect of processing.

Group 3: Incoherence between IS and IG records - An incoherence occurs when companies report either only transactions for processing in IG or only processing services in IS. In either case it is assumed that this is due to a misreporting of the NoT codes in IG. When only IG observations are observed, the flows are reclassified so that they contribute to total imports or exports. When only IS transactions are observed, a procedure has been set up to detect the share of IG flows attributable to processing. The procedure takes advantage of an integrated source that links transactions in goods and in processing services by company, counterpart's country of residence and product.

Extra-EU

For Extra-EU transactions, in the absence of a reliable supplementary data source, the procedure is fully based, with the only exception of oil refining, on IMTS. Temporary flows are divided between symmetric and asymmetric and the symmetric ones are further divided between those with a positive implicit processing service (IPS, difference between the value of the good after and before processing) and with a negative implicit processing service. Mark-ups are computed on the subset of companies with a positive IPS and then the median is applied in the case of asymmetric flows, while for symmetric flows individual observations are steered within an "acceptance region" of the distribution by company, geographical area and service product. A correction on IMTS is carried out for asymmetric cases to derive the unknown value of goods exports and imports on the basis of the estimate for the corresponding processing service.