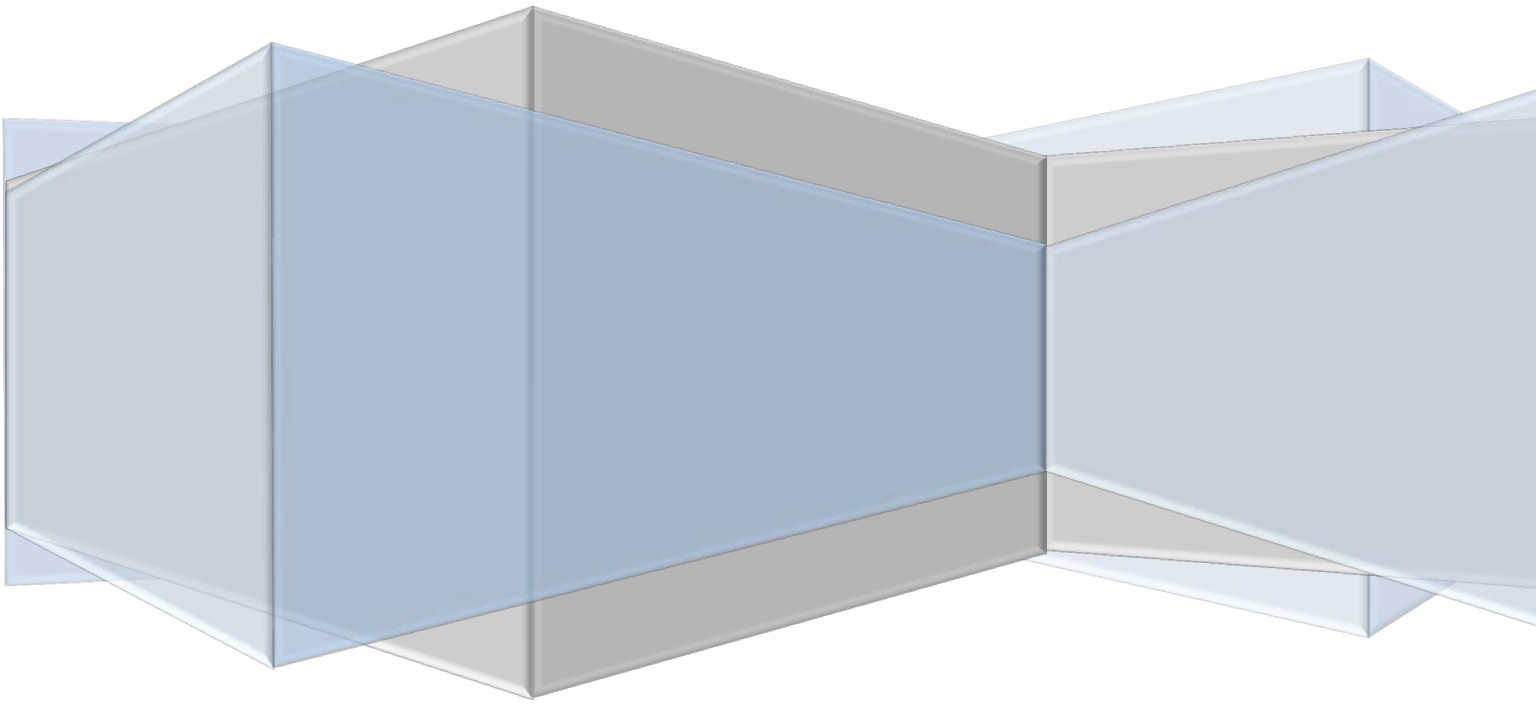
BANCA D'ITALIA
EUROSISTEMA

10 OCTOBER 2016

ITALY'S INTERNATIONAL FREIGHT TRANSPORT

2015



ITALY'S INTERNATIONAL FREIGHT TRANSPORT

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We wish to thank the firms that took part in the survey and answered our questions in a long and wide-ranging interview for which they received no compensation.

This publication has been prepared by Enrico Tosti and Simonetta Zappa.

1 INTRODUCTION

As part of its activities directed at collecting information for compiling the balance of payments, since 1999 the Bank of Italy has conducted sample surveys of international freight transport operators.

The main purpose of the surveys is to estimate the unit cost of transport to and from Italy by mode of transport as well as carriers' market shares by nationality. The tonnage of the imports and exports to and from Italy is estimated using Istat data on foreign trade and is an indicator of the quantities transported across borders.

On the basis of market shares, the quantities transported were attributed to Italian or foreign carriers. Finally, the freight rates were multiplied by the quantities obtained, yielding an estimate of the transport services purchased and sold abroad. Other elements, such as cross-trade by Italian carriers, play a role in the estimates.[1]

The findings of the survey[2] are also used to extend and adjust the breakdown of foreign trade data by mode of transport. In fact, road transport is overestimated to the detriment of other modes of transport, especially rail freight. The data are provided in the Statistical Appendix while the procedure for extending and adjusting the analysis is described in the Methodological Note.

2 INTERNATIONAL FREIGHT RATES

This section illustrates the findings of the 2015 survey by mode of transport and by area of origin/destination. Some 154 operators were interviewed and over 5,200 shipments were recorded.

Freight rates are shown at market prices in euros per metric tonne that include ancillary costs (e.g. load handling, motorway tolls and shipping agents' commissions), for which data are also gathered through interviews with transport operators. In specific cases the freight rates are provided in the tariff currency (the dollar is used for almost all types of sea freight) or net of ancillary services.

The average freight rates for each mode of transport are calculated as an average weighted by the volumes transported, broken down by area of origin/destination. Their trend over time, therefore, reflects the geographical composition of the quantities being moved. The data on freight rates are collected quarterly for container and bulk sea freight, semi-annually for air freight, and annually for road and rail freight and all other types of sea transport. For the sake of simplicity, only the annual averages are given.

Overall, over the course of 2015 sea freight rates followed a downward trend, particularly in container and dry bulk cargo, owing to declining fuel prices, weak growth in global trade volumes and an excess supply of cargo. All these factors, except the last one, influenced the dynamics of air freight rates as well. Conversely, rail and, in part, road freight rates increased. With the exception of road transport, Italian carriers' market shares fell again in 2015 after the raise recorded in 2014.

[1] For further insight into cross-trade see the methodological note published on the Bank of Italy's website at http://www.bancaditalia.it/statistiche/tematiche/rapporti-estero/trasporti-internazionali/armatori.pdf (only in Italian).
[2] For an analytical approach see Pastori et al. (2014), 'L'indagine sui costi del trasporto internazionale delle merci in Italia: metodi e risultati', Quaderni di Economia e Finanza (Occasional Papers), 223, http://www.bancaditalia.it/pubblicazioni/qef/2014-0223/index.html (only in Italian).

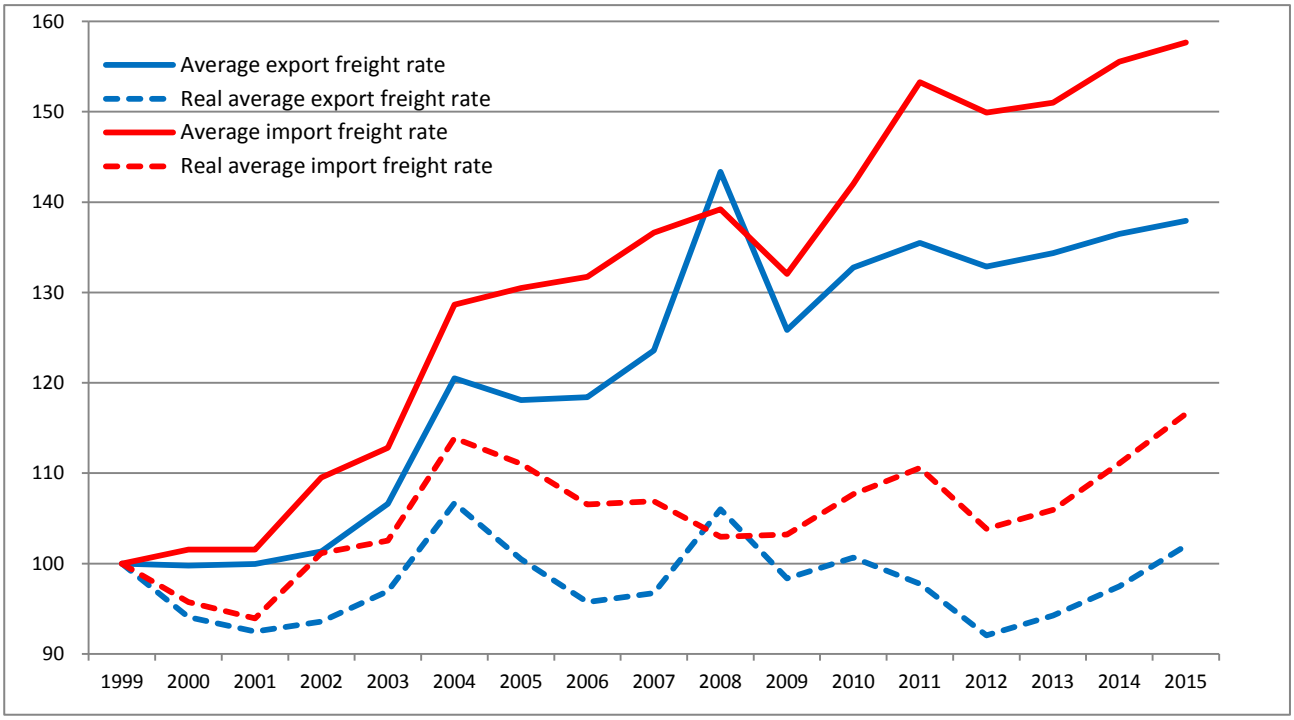
2.1 Road freight rates

In real terms, road freight rates have returned to pre-global crisis levels

The average road freight rates between 1999 and 2015 shows an upward trend in nominal terms, especially for imports, only stalling in 2012 (Figure 1). In real terms, using as deflator the producer price index, export freight rates are now near the levels of 2008, while import freight rates have reached their highest level since the beginning of the time series.

Figure 1

Historical trends of average road freight rates (nominal and real terms)[1]
(euros per metric tonne; averages, weighted by flows, 1999=100)



(1) Nominal values are deflated using Istat's producer price index.

In 2015 groupage freight rates increased while full container load freight rates decreased

In 2015, against the backdrop of growing transported volumes on both the import and export sides (see Table A.1 in the Appendix), there was an increase of just over 1 per cent in average freight rates, despite the decrease in fuel prices. As in the previous year, the rise may be attributed to an increase in groupage shipping, which has grown in recent years and now represents almost 40 per cent of road-transported volumes. The slight increase in ancillary services, notably motorway tolls, also contributed to the increase in freight rates.

Table 1

Average freight rates (groupage and full truck load) – 2015

	Average freight rates - all types of cargo (includes ancillary services)				**Groupage and full truck load freight rates** (average of exports and imports; excludes ancillary services)			
	Export (€/tonne)	% change on 2014	Import (€/tonne)	% change on 2014	Full truck load (€/vehicle)	% change on 2014	Groupage (€/tonne)	% change on 2014
Austria – Switzerland	104.3	4.9	104.3	5.0	1,090	-1.6	191	7.1
Benelux	116.3	2.8	116.3	2.1	1,603	-1.7	183	4.9
Eastern Europe*	107.8	4.8	102.4	5.9	1,277	-1.1	185	9.4
France	115.7	1.8	116.2	1.7	3,696	-4.3	229	10.9
Germany	119.4	1.0	119.2	1.0	1,235	-4.2	211	3.6
Greece – Turkey	149.0	-6.6	128.2	-7.0	1,276	-4.7	217	2.8
Balkans	119.6	3.3	121.5	4.5	2,000	-8.6	207	-7.7
Baltic states	137.4	1.3	140.8	3.4	1,645	-1.4	154	-0.3
Former USSR	199.3	0.8	168.6	-3.2	1,343	-2.0	218	6.7
UK - Ireland	185.4	5.4	147.3	1.6	1,989	4.1	224	3.2
Scandinavia	139.5	-11.0	142.4	-15.4	2,366	-13.6	207	-8.8
Spain – Portugal	108.3	-2.6	100.2	0.0	2,549	-0.8	257	4.2
Weighted average**	120.7	1.1	115.0	1.4	1,458	-3.9	202	3.9

* 'Eastern Europe' includes Poland, the Czech Republic, Slovakia and Hungary. ** Weights are based on transported volumes.

The higher share claimed by groupage, a business with greater value added, is due to the size of shipments, which is on average smaller than in the past owing also to the weak recovery in intra-European trading volumes. Full truck loads have displayed decreasing freight rates (net of ancillary services) in almost all the geographical areas considered, including France and Germany, Italy's main trading partners.

2.2 Rail freight rates

Rail freight rates are still historically low …

Despite recovering in the last three years, rail freight rates (for both combined and conventional transport) have not returned to the levels preceding the sharp drop recorded in 2008 (Figure 2). This reflects growing competition in the sector, with the market share of the former monopolist, the Italian state railways, decreasing steadily and demand for transport hampered both by the competition with road transport and by poor infrastructure.

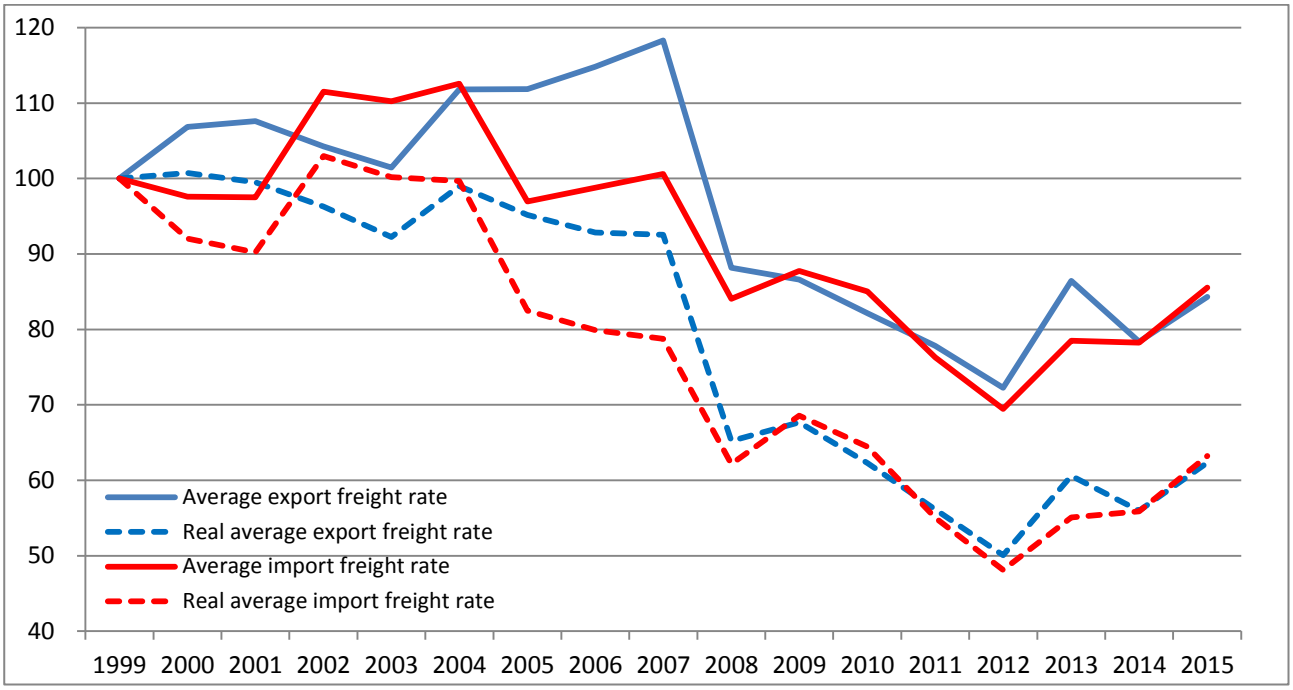
…. despite the pick-up recorded in 2015

With exported volumes increasing and imported volumes stable (Table A.1), combined transport rail freight rates rose in 2015 compared with the previous year (Table 2). The increase was more marked for countries in the former Soviet Union, Eastern Europe and the Balkans, and more moderate for those in Western Europe. Growth was stronger for rail transport as a whole, owing to the trends in conventional rail transport, a sector less affected by the growing competition that marks combined rail transport. Interviews with rail transport operators confirm the sector's gradual but steady loss of market shares to road transport.

Figure 2

Historical trends of average rail freight rates (nominal and real terms)[1]

(euros per metric tonne; averages, weighted by combined and conventional transport flows, 1999=100)



(1) Nominal values are deflated using Istat's producer price index.

Table 2

Rail freight rates: total and combined transport only – 2015

	Average freights rates - all types of cargo				Combined transport freight rates			
	Export (€/tonne)	% change on 2014	Import (€/tonne)	% change on 2014	Export (€/tonne)	% change on 2014	Import (€/tonne)	% change on 2014
Austria – Switzerland	35.9	8.6	34.1	10.5	45.0	2.7	44.9	2.8
Benelux	46.8	4.6	45.9	5.8	51.9	0.8	50.5	1.1
Eastern Europe*	69.4	13.2	68.4	13.3	79.4	11.9	74.4	11.4
France	42.1	6.0	38.7	8.8	49.2	1.5	48.7	1.6
Germany	42.0	6.7	40.1	7.8	48.6	1.6	49.4	1.4
Greece – Turkey	60.3	2.5	60.0	4.0	59.0	-0.7	62.1	-1.3
Balkans	87.9	10.8	71.1	11.9	92.1	8.7	81.4	7.5
Baltic states	130.0	1.4	133.6	5.9	127.6	-5.5	141.0	-3.6
Former USSR	151.9	13.8	153.6	12.6	149.3	15.0	141.2	14.8
United Kingdom - Ireland	53.1	3.7	51.9	5.0	54.7	0.1	55.2	0.0
Scandinavia	60.8	2.6	60.2	4.9	58.7	-0.7	58.1	-0.6
Spain – Portugal	47.8	5.0	49.1	5.5	54.3	0.2	50.9	1.0
Weighted average**	**51.3**	**7.6**	**48.2**	**9.3**	**57.8**	**3.7**	**55.4**	**3.6**

* 'Eastern Europe' includes Poland, the Czech Republic, Slovakia and Hungary. ** Weights are based on transported volumes.

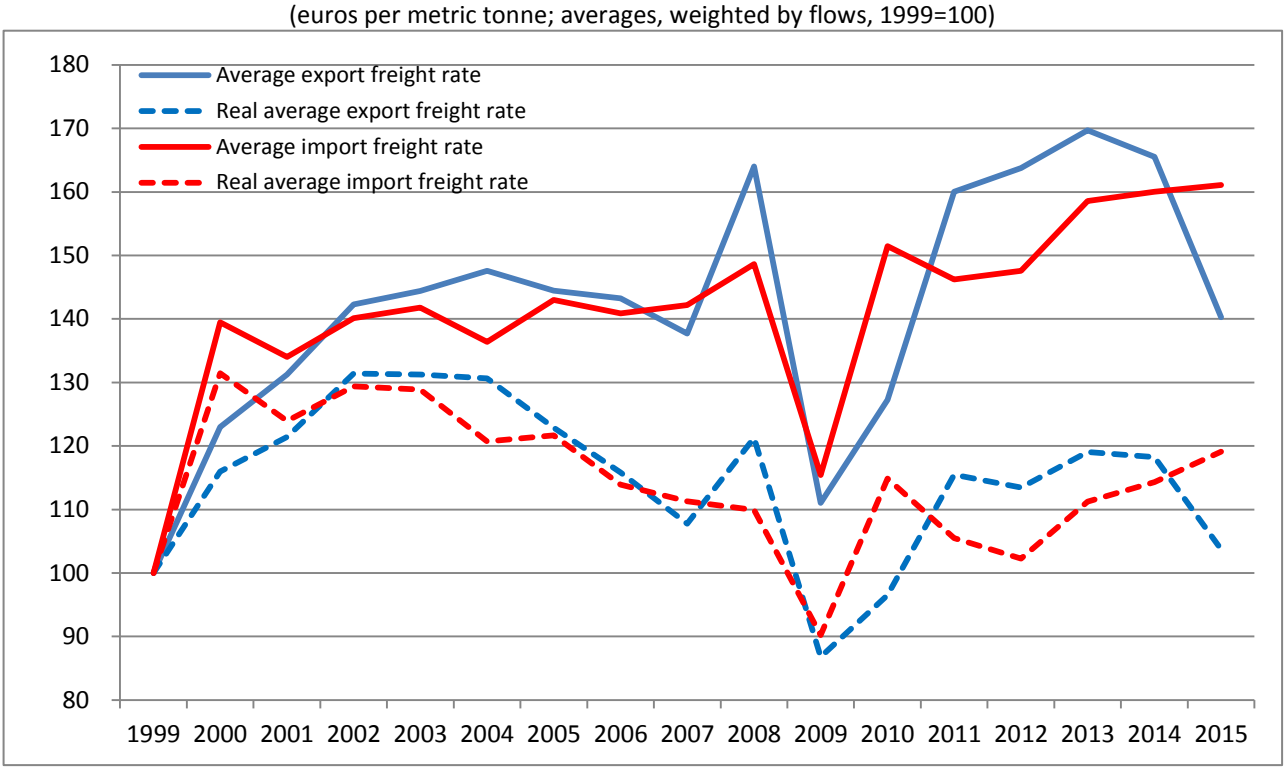
2.3 Air freight rates

Import freight rates have recouped pre-global crisis levels; export freight rates have been declining since 2014 after a strong recovery in 2011-13

Following the sharp drop recorded between the second half of 2008 and 2009, import air freight rates in nominal terms have overtaken pre-global crisis levels (Figure 3); export air freight rates, which had been increasing strongly up to 2013, fell sharply in the following two years.
When deflated using the producer price index, the freight rates remain below the peaks registered at the beginning of the last decade.

Figure 3

Historical trends of average air freight rates (nominal and real terms) [1]
(euros per metric tonne; averages, weighted by flows, 1999=100)



(1) Nominal values are deflated using Istat's producer price index.

In 2015 air freight rates fell for exports and remained stable for imports

In 2015 freight rates including ancillary services recorded a pronounced and widespread drop on the export side; as for imports, the increase registered vis-à-vis Japan, Korea and Indonesia offset the decrease regarding Europe and the Americas (Table 3). The decline is attributable to the drop in fuel prices and was concentrated in the first part of the year.

Table 3

Air freight rates – 2015

	Export		Import	
	Freight rate (€/tonne)	% change on 2014	Freight rate (€/tonne)	% change on 2014
Europe	1,716	-3.9	1,715	-3.9
Russia	1,628	-4.8	1,660	-3.0
Mediterranean and Middle East	1,712	-13.7	1,665	-16.1
Rest of Africa	2,391	-16.7	2,040	-29.0
India	1,421	-15.4	2,905	-0.1
Indonesia - Singapore	1,523	-16.6	3,515	11.0
China	1,296	-25.2	3,655	-3.0
Japan - Korea	1,826	-18.3	3,325	13.9
Oceania	3,144	-5.1	3,145	-5.1
USA and Canada	1,858	-14.1	1,920	-1.2
Central and South America	2,790	-12.3	2,790	-12.3
Weighted average*	1,764	-15.3	2,830	0.7

* Weights are based on transported volumes.

2.4 Sea freight rates

Data on sea freight rates are collected separately for each type of cargo – container, bulk, general and Ro-Ro (Roll-on, Roll-off); see Appendix for definitions – to account for the different features of the various market segments.

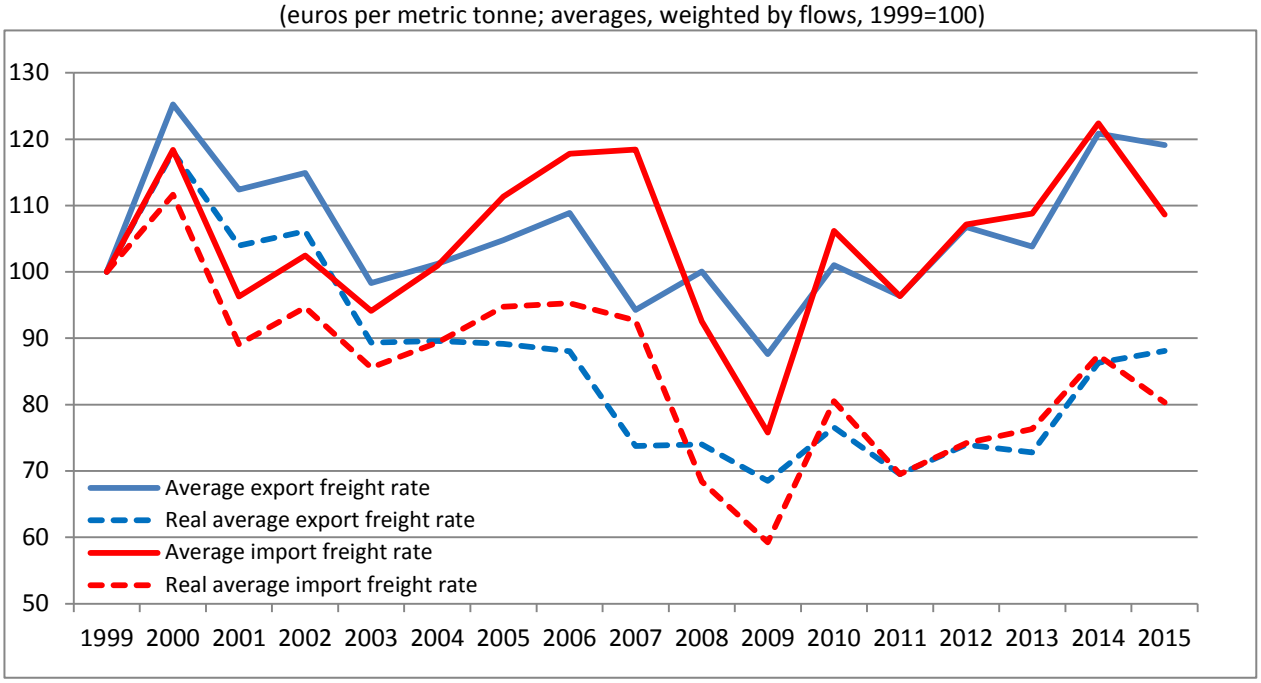
2.4.1 Container sea freight

In 2015 the recovery in container sea freight rates came to a halt

Looking at the historical trend of container sea freight including ancillary services, moderate recovery is visible in recent years (Figure 4). When deflated using the producer price index, the freight rates remain however below the levels recorded at the beginning of the last decade, being affected, among other factors, by the weak recovery in transported volumes compared with the peaks attained before the onset of the global crisis.

Figure 4

Historical trends of average container sea freight rates (nominal and real terms)[1]
(euros per metric tonne; averages, weighted by flows, 1999=100)



(1) Nominal values are deflated using Istat's producer price index.

Container sea freight rates in dollars fell sharply

In 2015, despite the increase in imported and, especially, exported volumes (see Table A.1 in the Appendix), freight rates in euros per metric tonne decreased (Table 4). The drop was more pronounced for imports and concentrated in purchases from China and other Asian countries. Based on the market rates identified by the survey – in twenty-foot equivalent units (TEU) and net of ancillary services – also export freight rates showed a steep downward trend due to a decline in fuel prices. The appreciation of the dollar on average in 2015 compared with the previous year partially offset the reduction.

Table 4

Sea freight rates - container shipping - 2015

	Freight rates (euros/metric tonne) (includes ancillary services)				**Freight rates (dollars/TEU)** (excludes ancillary services)			
	Export	% change on 2014	Import	% change on 2014	Export	% change on 2014	Import	% change on 2014
Europe	107.1	2.4	103.8	2.6	516	-9.1	514	-9.3
Mediterranean	98.8	-2.3	95.7	-2.5	442	-17.2	441	-17.5
Rest of Africa	154.2	-0.1	148.6	-0.0	1,198	-13.6	1,197	-13.7
Middle East	118.6	-10.3	114.6	-10.2	695	-30.2	694	-30.4
India	115.3	-0.8	104.5	-13.2	731	-13.0	641	-34.0
Southeast Asia	83.1	-4.9	124.2	-14.1	281	-20.3	857	-34.2
China, Japan and rest of East Asia	82.3	-3.8	119.1	-21.0	258	-15.7	776	-43.8
Oceania	173.3	8.9	167.7	8.9	1,224	0.8	1,222	0.6
USA and Canada	188.3	4.3	149.8	-9.2	1,360	-9.3	931	-30.9
Central America	158.0	-0.4	152.5	-0.3	1,205	-15.8	1,204	-15.9
South America	139.5	-16.7	135.0	-16.3	886	-43.4	884	-43.4
Weighted average*	123.6	-1.4	121.0	-11.2	718	-16.7	747	-32.7

* Weights are based on transported volumes.

2.4.2 Bulk sea freight (liquid and dry)

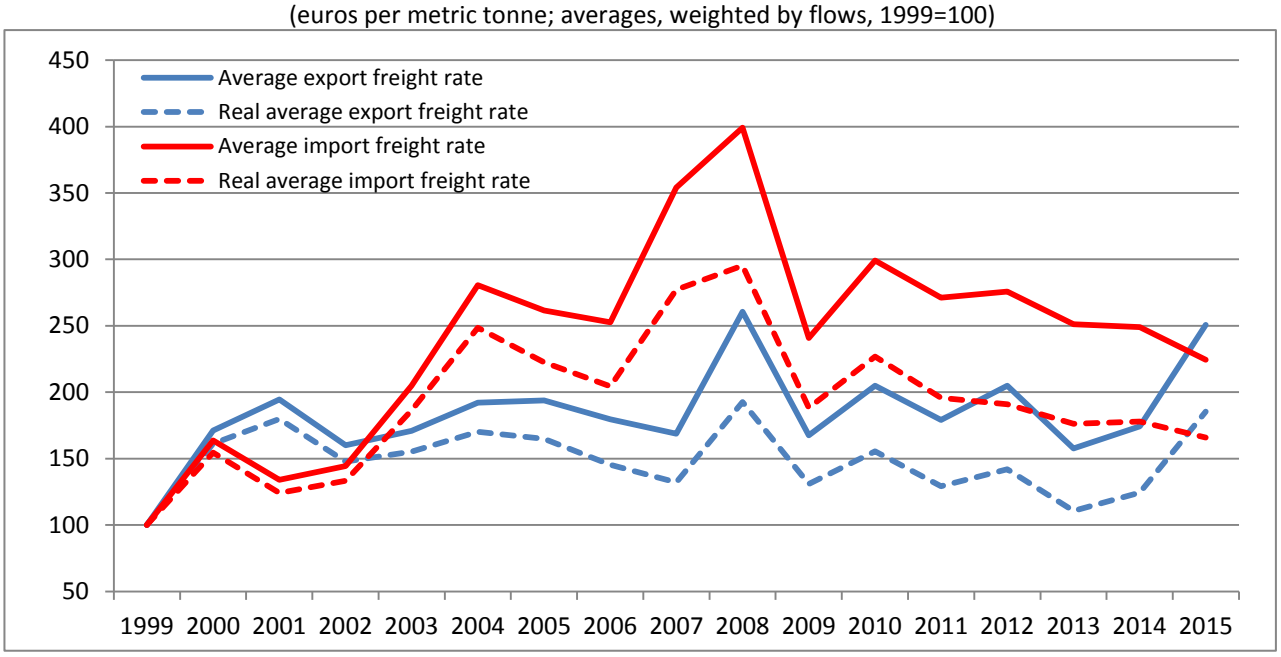
The expansion in dry bulk freight rates over the last ten years has been absorbed, while liquid bulk freight rates are rising again

The time series of average bulk sea freight (including ancillary services), observed on a quarterly basis, shows a downward trend for dry bulk cargo (Figure 5) under way since the peak recorded at the beginning of 2008, a sign that the market is still struggling to find a balance between cargo demand and supply. Freight rates have almost returned to the levels of 2002-03, i.e. those preceding the protracted rise in prices caused by growing demand, mainly from the emerging economies (e.g. China), against the backdrop of rigidities in the world merchant fleet's adjustment of its transport capabilities.

Liquid bulk freight rates showed a similar but less pronounced trend. The signs of recovery for the last two years for which the data are available could indicate more balanced market conditions between cargo demand and supply.

Figure 5

Historical trends of average liquid and dry bulk freight (nominal and real terms)[1,2]
(euros per metric tonne; averages, weighted by flows, 1999=100)



(1) Nominal values are deflated using Istat's producer price index and weighted by transported volumes. (2) Only import freight rates are given, as these are much more significant for a country like Italy, which is an importer of commodities and raw materials.

Liquid bulk freight rates increased in 2015 …

In 2015 trade volumes for oil and oil products and for chemical products rose sharply (Table A1), interrupting the negative trend under way since 2011. For the second consecutive year freight rates in dollars increased, especially for the transport of oil and oil products; the increase in prices in euros was amplified by the US dollar exchange rate. Besides the recovery in prices, the reduction in fuel prices enabled profitability to return to satisfactory levels for carriers. Against this backdrop, however, medium- and long-term agreements (time charters for two or three years) have decreased and this could lead to an increase in price volatility.

… while dry bulk freight rates continue to decline

As regards dry bulk, in conjunction with the reduction in imported volumes (Table A1), in 2015 market freight rates (dollar-denominated) dropped sharply both for the transport of coal and metal ores and, less markedly, for imported agricultural commodities; the reduction in euros was less significant, owing to the

dollar exchange rate (Table 5). Overall, operators report that freight rates are at somewhat low levels compared with the costs incurred by shipowners to manage their fleet, despite the drop in fuel prices. Freight rates for dry bulk cargo reached an all-time low at the end of 2015, even descending below 10 dollars per metric tonne, as a consequence of the protracted excess of supply.

Table 5

Sea freight rates - bulk - 2015

		Average freight rates (euros per metric tonne)			
		Export	% change on 2014	Import	% change on 2014
Liquid cargo	Petroleum and petroleum products	11.3	31.7	16.2	47.7
	Chemicals	77.0	26.3	79.0	30.3
Dry cargo	Coal and metal ores	16.2	-10.9	16.2	-10.9
	Grain	25.7	8.3	30.6	-3.4

2.4.3 General cargo and Ro-Ro freight rates

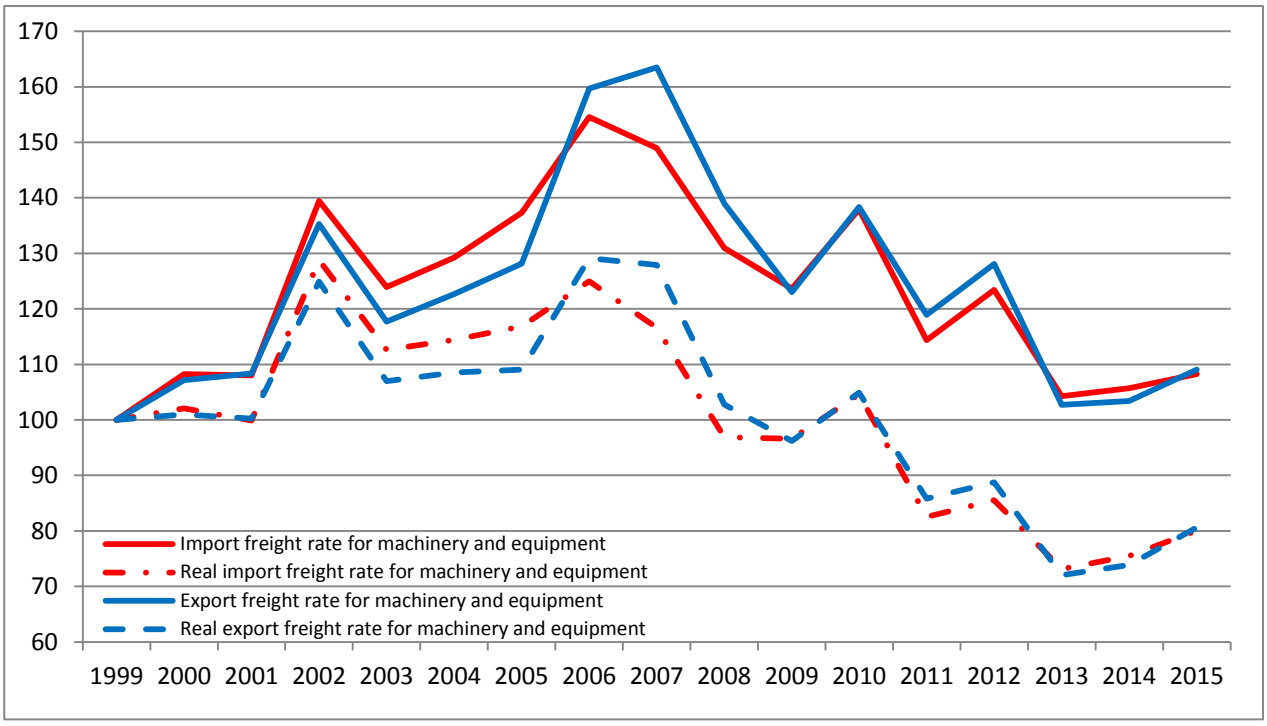
General cargo freight rates are still at historically low

Looking at the type of cargo of greater interest here, i.e. machinery, equipment and transport equipment, the average general cargo freight rates, including ancillary services and measured in euros per metric tonne, picked up in 2014-15, signalling that the market is reaching equilibrium after the sharp drop that followed the peak recorded between 2006 and 2007 (Figure 6).

Figure 6

Historical trends of average general cargo freight (nominal and real terms)[1]

(transport of machinery and equipment; euros per metric tonne; averages, weighted by flows, 1999=100)



(1) Nominal values are deflated using Istat's producer price index.

In 2015 euro-denominated general cargo freight rates increased, affected by the depreciation of the euro against the dollar

Despite an increase in the volumes imported via general cargo (Table A1), freight rates denominated in dollars per metric tonne decreased on average. The depreciation against the dollar over the course of 2015 has, however, more than compensated for this effect, triggering an increase in freight rates in euros both for imports and exports, especially for the items falling under the category 'chemicals, building materials and forest products'. Freight rates increased for the transport of machinery and equipment as well, especially on the export side (Table 6).

Table 6

Sea freight rates – general cargo – 2015

	Export		Import	
	Freight rate (€/tonne)	% change on 2014	Freight rate (€/tonne)	% change on 2014
Machinery and equipment and transport equipment	233.2	5.4	236.3	2.4
Chemicals, building material and forest products	73.6	11.1	84.0	14.0
Tubes, pipes and metal products[2]	64.8	0.9	73.9	9.4

Note: (1) 'Machinery and equipment and transport equipment' represents categories 11 (Machinery and equipment) and 12 (Transport equipment) of the NST 2007 classification; (2) 'Tubes, pipes and metal products' represents category 10 (Basic metals; fabricated metal products, except machinery and equipment) of the NST 2007 classification.

Ro-Ro freight rates decreased in 2015

Despite an increase in transported volumes (Table A.1), euro-denominated Ro-Ro freight rates (i.e. the transport of road vehicles by ship, usually in the Mediterranean area) fell by around 2 per cent on average for flows in both directions, and especially for trade with Turkey (Table 7).

Table 7

Sea freight rates – Ro-Ro shipping – 2015

	Export/Import	
	Freight rate (€/metric tonne)	% change on 2014
Balkans	26.4	5.6
France	25.0	14.2
Greece	44.8	2.6
North Africa	130.9	-2.8
Spain	57.2	-0.7
Tunisia-Malta	63.4	-2.7
Turkey	73.3	-11.4
Weighted average*	101.9	-2.2

* Weights are based on transported volumes

3 CARRIERS' MARKET SHARES

Since 2002 the survey has featured a section dedicated to estimating how the international transport of merchandise to and from Italy breaks down between Italian and foreign carriers. For air transport the estimates rely on data from administrative sources, while specific sample surveys are conducted for sea and road transport. These surveys constitute an innovative source of information even from an international point of view, because the statistics available for the maritime sector often refer to the shipowner rather than the ship operator, and use that piece of information to determine residence when compiling the balance of payments (see the Methodological Note in the Appendix).

Table 8 gives the times series of the market shares of carriers resident in Italy for sea, road and air transport.

In 2015 the market shares of Italian carriers resumed a downward trend, with the exception of road transport

After a break in 2014, the downward trend in the average market share held in maritime transport in the last decade resumed in 2015. Apart from container freight, where there was a slight pick-up, Italian carriers saw their market shares shrink in the other types of sea freight, including Ro-Ro, where resident carriers still hold the leading share (Table 8). In road transport, instead, the share of resident carriers picked up, rising to 26.8 per cent and interrupting a ten-year downward trend; in air transport the market share of Italian carriers diminished slightly, to 16.3 per cent, still above the low of 2013 connected with the crisis affecting Italy's flag carrier and other domestic airlines.

Table 8

Market shares of Italian carriers (weighted by transported volumes; per cent)

YEARS	SHIP						ROAD	AIR
	Liquid bulk	Dry bulk	Container	General cargo	Ro-Ro	Average		
2002	23.3	8.0	16.0	16.0	n.a.	17.5	33.0	34.7
2003	27.7	10.3	11.9	24.4	n.a.	20.6	33.0	24.5
2004	19.4	12.9	5.7	14.6	n.a.	15.0	36.1	23.6
2005	20.8	8.6	8.9	17.7	n.a.	15.5	35.2	29.3
2006	19.6	15.5	9.3	16.7	n.a.	16.5	34.7	30.3
2007	21.5	13.6	7.9	17.9	n.a.	17.0	32.1	30.2
2008	18.2	12.1	10.6	18.6	25.0	15.8	30.7	26.3
2009	21.2	12.2	5.5	16.7	23.8	16.6	28.6	17.4
2010	18.9	8.8	1.6	10.0	32.2	14.1	27.9	21.5
2011	18.0	12.7	2.8	12.9	27.4	13.9	27.4	20.6
2012	16.6	13.6	3.2	11.6	23.8	13.2	26.4	19.2
2013	13.8	12.2	2.7	10.1	29.7	11.5	25.7	15.7
2014	13.7	12.1	2.5	10.5	39.7	11.6	25.3	16.9
2015	10.7	8.9	2.8	9.7	34.1	9.4	26.8	16.3

Table 9 gives the estimated market shares for non-resident sea transport carriers, distinguishing between five types of cargo and providing a breakdown by country of residence. In container transport the main carriers are Swiss and German, while in bulk transport Greece ranks first (with a very high share of liquid bulk) and Italy second (for liquid bulk) and third (for dry bulk). Turkish and German ship operators dominate general cargo transport (with Italy coming fourth), while Italian ship operators enjoy the top position in Ro-Ro, followed by their Turkish and Greek competitors.

Table 9

Market shares of sea transport carriers – 2015 (per cent)

Container		Dry bulk		Liquid bulk		General Cargo		Ro-Ro	
Switzerland	33.6	Greece	21.4	Greece	44.7	Turkey	26.8	**Italy**	**34.1**
Germany	10.9	Germany	9.8	**Italy**	**10.7**	Germany	14.0	Turkey	23.4
China	9.8	**Italy**	**8.9**	USA	6.7	Netherlands	10.8	Greece	18.2
Denmark	7.8	Turkey	8.7	Denmark	4.7	**Italy**	**9.7**	Japan	6.5
Kuwait	6.0	Japan	8.5	Russia	3.5	Norway	7.5	Switzerland	5.1
France	4.7	China	5.0	Turkey	3.0	Russia	4.2	Tunisia	2.4
Singapore	4.0	USA	4.5	Canada	2.7	Greece	3.3	Norway	2.0
South Korea	4.0	Netherlands	3.1	United Kingdom	2.6	Denmark	2.1	Belgium	1.8
Taiwan	3.0	Norway	2.2	Netherlands	2.5	United Kingdom	1.8	Sweden	1.6
Japan	2.9	Bermuda	2.2	Hong Kong	2.3	Spain	1.6	Denmark	1.1
Italy	**2.8**	Canada	2.1	Singapore	2.0	Bulgaria	1.6	Saudi Arabia	1.0
Israel	2.3	Hong Kong	2.0	Monaco	1.9	Ukraine	1.5	Croatia	0.5
Netherlands	2.0	Bulgaria	2.0	Sweden	1.5	Austria	1.4	Montenegro	0.4
Greece	1.7	Russia	1.8	Germany	1.4	Lebanon	1.4	Madeira	0.4
Turkey	0.8	South Korea	1.7	Japan	1.0	Switzerland	1.4	South Korea	0.3
United Kingdom	0.8	Switzerland	1.7	Norway	0.9	Marshall Islands	1.2	France	0.3
Hong Kong	0.5	Monaco	1.5	Saudi Arabia	0.9	Albania	1.2	Germany	0.2
Subtotal	*97.6*	*Subtotal*	*87.1*	*Subtotal*	*93.0*	*Subtotal*	*91.6*	*Subtotal*	*99.3*
Others	2.4	Others	12.9	Others	7.0	Others	8.4	Others	0.7
Total	**100.0**	**Total**	**100.0**	**Total**	**100.0**	**Total**	**100.0**	**Total**	**100.0**

STATISTICAL APPENDIX

Table A.1

Exported and imported volumes by mode of transport
(annual data; millions of tonnes)

IMPORT	SEA					RAIL		ROAD	AIR
	Liquid bulk	Dry bulk	Container	General cargo	Ro-Ro	Container	Bulk		
1999	127.3	55.7	16.7	19.5	n.a.	9.1	16.8	35.0	0.4
2000	129.7	60.1	17.8	20.7	n.a.	9.8	17.6	38.4	0.5
2001	124.3	61.1	17.1	21.6	n.a.	9.9	17.6	40.2	0.4
2002	121.4	59.9	17.0	21.7	n.a.	9.8	17.0	42.3	0.3
2003	117.7	62.7	18.2	22.5	n.a.	10.1	17.2	44.4	0.4
2004	114.3	69.8	17.8	23.6	n.a.	10.7	17.9	47.9	0.4
2005	113.7	66.5	17.3	23.1	n.a.	10.8	17.9	50.0	0.4
2006	111.0	65.8	20.0	23.8	5.1	11.6	19.1	53.9	0.4
2007	114.0	70.3	21.8	25.0	4.9	11.9	19.9	58.4	0.4
2008	106.7	68.1	20.8	22.7	4.6	11.0	18.6	54.3	0.3
2009	99.1	48.9	16.9	14.9	4.2	9.3	15.9	47.9	0.3
2010	106.0	51.0	21.0	20.3	4.2	10.7	19.1	55.7	0.3
2011	97.8	55.2	20.2	21.3	4.4	10.7	18.9	55.8	0.3
2012	78.9	51.4	16.6	17.7	3.9	10.1	17.3	52.7	0.3
2013	81.9	47.3	17.4	18.4	3.3	11.2	18.0	53.5	0.3
2014	73.9	44.7	18.2	19.4	3.3	11.8	19.0	55.9	0.3
2015	84.5	43.2	18.9	21.2	3.3	11.8	18.7	57.0	0.3
EXPORT	SEA					RAIL		ROAD	AIR
	Liquid bulk	Dry bulk	Container	General cargo	Ro-Ro	Container	Bulk		
1999	18.7	4.5	19.2	8.6	n.a.	7.9	5.0	36.9	0.4
2000	18.1	4.4	20.9	9.7	n.a.	8.7	5.2	39.5	0.4
2001	18.2	3.9	20.8	9.6	n.a.	9.2	5.4	40.3	0.4
2002	18.0	3.3	21.8	9.7	n.a.	9.3	5.5	40.7	0.5
2003	21.0	2.6	20.8	9.1	n.a.	9.5	5.6	40.8	0.4
2004	21.3	2.4	22.3	9.8	n.a.	10.3	5.8	43.5	0.5
2005	24.7	2.1	23.0	10.3	n.a.	11.1	6.2	45.9	0.5
2006	23.0	1.7	24.0	9.4	5.3	12.0	6.9	48.1	0.5
2007	27.2	2.7	25.3	9.5	5.5	12.7	7.4	54.5	0.7
2008	25.8	2.9	25.5	9.9	5.4	12.1	7.3	52.6	0.5
2009	24.2	2.4	21.6	7.0	4.2	9.8	6.1	42.2	0.4
2010	27.7	2.8	24.7	7.7	4.4	12.4	7.9	52.7	0.5
2011	23.7	2.5	25.8	7.6	4.1	12.6	7.9	53.6	0.5
2012	25.8	2.4	27.3	8.5	4.1	12.5	7.8	53.3	0.5
2013	19.1	4.1	25.1	9.9	3.9	10.2	8.6	55.5	0.5
2014	18.5	4.2	25.4	10.1	3.8	9.3	8.5	52.2	0.5
2015	22.7	4.1	27.0	10.1	4.0	9.8	8.7	54.5	0.5

Sources: Based on data from Istat, Alps Crossing, Eurostat and ENAC.

Note: provisional data for 2015.

Table A.2

Exported and imported values by mode of transport
(annual data; billions of euros)

IMPORT	SEA					RAIL		ROAD	AIR
	Liquid bulk	Dry bulk	Container	General cargo	Ro-Ro	Container	Bulk		
1999	18.0	6.6	41.5	19.1	n.a.	14.6	18.0	67.9	15.8
2000	31.3	7.4	47.2	23.0	n.a.	17.3	20.7	82.5	20.1
2001	28.2	7.6	44.2	22.3	n.a.	18.5	21.6	91.2	20.0
2002	25.3	7.0	40.2	20.2	n.a.	18.5	21.2	94.8	19.8
2003	24.5	6.6	37.3	19.4	n.a.	19.1	21.5	100.2	18.6
2004	25.6	7.6	37.3	21.4	n.a.	20.9	23.1	111.7	19.7
2005	33.6	7.7	36.8	21.3	n.a.	22.1	23.8	120.3	21.2
2006	39.9	8.0	38.5	22.0	5.9	24.6	26.6	136.3	22.3
2007	41.6	9.3	44.0	25.4	6.4	26.3	28.7	153.2	20.5
2008	49.8	11.2	45.2	24.2	6.3	25.1	27.8	147.8	20.3
2009	31.2	7.9	36.7	14.6	4.9	20.4	22.5	121.8	18.3
2010	45.7	9.3	49.7	20.0	6.0	24.0	26.6	144.1	20.9
2011	54.9	11.8	52.6	22.5	6.7	25.1	27.9	152.9	22.8
2012	53.8	10.7	44.8	18.9	6.1	22.8	25.4	142.3	23.5
2013	49.3	7.8	43.5	17.7	5.9	29.2	23.8	138.4	22.5
2014	40.9	7.5	46.5	18.4	6.3	29.5	24.9	140.4	23.4
2015	31.0	7.5	51.8	20.0	7.3	31.1	27.0	149.9	26.3
EXPORT	SEA					RAIL		ROAD	AIR
	Liquid bulk	Dry bulk	Container	General cargo	Ro-Ro	Container	Bulk		
1999	2.9	1.3	43.7	22.0	n.a.	19.8	10.5	98.7	17.9
2000	4.9	1.3	52.5	25.6	n.a.	23.5	11.9	112.4	22.8
2001	4.5	1.2	54.1	24.9	n.a.	25.9	12.6	119.1	24.3
2002	4.2	1.0	53.0	22.7	n.a.	26.0	12.4	116.7	24.4
2003	4.9	0.8	48.6	20.1	n.a.	27.2	12.6	118.4	23.0
2004	5.6	0.6	50.8	20.3	n.a.	30.1	13.7	129.0	24.4
2005	8.7	0.4	52.6	19.3	n.a.	32.2	14.5	135.3	26.1
2006	9.5	0.3	57.4	15.3	11.8	36.6	16.2	145.0	28.6
2007	11.4	0.5	62.2	18.0	13.2	39.8	17.8	169.6	31.7
2008	13.8	0.7	65.1	19.7	13.6	38.5	17.9	168.7	30.7
2009	8.4	0.5	54.7	15.3	10.4	30.0	14.1	131.1	25.9
2010	13.1	0.6	60.9	16.5	11.5	34.2	16.0	151.0	30.8
2011	14.5	0.7	66.6	17.4	11.9	37.2	17.6	169.0	35.4
2012	17.9	0.7	72.2	18.9	11.7	37.0	17.4	171.0	38.0
2013	13.9	1.4	69.8	18.0	10.3	35.1	21.3	176.3	38.9
2014	12.2	1.4	72.9	18.4	10.4	36.2	21.7	181.3	39.2
2015	11.1	1.5	77.9	19.0	11.2	37.1	22.4	187.3	43.4

Sources: Based on data from Istat, Alps Crossing, Eurostat and ENAC.

Note: provisional data for 2015.

Average unit values in euros per metric tonne by mode of transport
(annual averages)

IMPORT	SEA					RAIL		ROAD	AIR
	Liquid bulk	Dry bulk	Container	General cargo	Ro-Ro	Container	Bulk		
1999	142	119	2,488	980	n.a.	1,609	1,072	1,939	36,929
2000	241	123	2,649	1,112	n.a.	1,770	1,175	2,148	42,367
2001	227	124	2,588	1,035	n.a.	1,862	1,226	2,269	54,425
2002	209	116	2,361	933	n.a.	1,896	1,249	2,242	57,581
2003	209	105	2,047	864	n.a.	1,884	1,251	2,255	48,422
2004	224	109	2,103	909	n.a.	1,945	1,289	2,335	53,762
2005	295	116	2,121	922	n.a.	2,042	1,330	2,404	59,066
2006	360	122	1,928	924	1,158	2,116	1,388	2,528	59,252
2007	365	133	2,014	1,016	1,302	2,217	1,440	2,621	53,885
2008	466	164	2,168	1,064	1,384	2,271	1,492	2,723	60,377
2009	314	161	2,171	984	1,172	2,196	1,414	2,543	52,471
2010	431	183	2,364	988	1,430	2,233	1,398	2,588	64,753
2011	561	214	2,608	1,058	1,514	2,338	1,475	2,740	71,558
2012	681	208	2,696	1,070	1,565	2,268	1,466	2,702	76,457
2013	601	165	2,495	960	1,800	2,594	1,321	2,585	82,822
2014	553	167	2,553	948	1,925	2,498	1,311	2,512	76,832
2015	367	174	2,747	943	2,208	2,640	1,443	2,631	95,517
EXPORT	SEA					RAIL		ROAD	AIR
	Liquid bulk	Dry bulk	Container	General cargo	Ro-Ro	Container	Bulk		
1999	157	277	2,279	2,545	n.a.	2,511	2,116	2,677	40,282
2000	271	287	2,515	2,637	n.a.	2,717	2,278	2,845	51,982
2001	249	300	2,594	2,610	n.a.	2,808	2,340	2,951	54,715
2002	233	299	2,436	2,336	n.a.	2,800	2,251	2,868	53,508
2003	235	291	2,337	2,213	n.a.	2,863	2,267	2,902	51,256
2004	263	261	2,275	2,060	n.a.	2,920	2,339	2,963	51,160
2005	352	211	2,288	1,868	n.a.	2,913	2,334	2,950	55,925
2006	413	157	2,398	1,629	2,237	3,047	2,334	3,015	59,448
2007	418	186	2,460	1,889	2,393	3,127	2,386	3,114	46,395
2008	534	221	2,551	1,997	2,519	3,179	2,460	3,209	61,747
2009	345	217	2,529	2,172	2,455	3,067	2,314	3,105	63,753
2010	473	212	2,464	2,145	2,606	2,750	2,029	2,865	67,666
2011	611	270	2,578	2,299	2,907	2,944	2,218	3,155	71,263
2012	692	300	2,641	2,224	2,854	2,951	2,230	3,209	78,245
2013	727	349	2,775	1,819	2,617	3,440	2,465	3,175	82,338
2014	662	343	2,866	1,822	2,767	3,897	2,568	3,472	82,010
2015	490	359	2,883	1,887	2,789	3,790	2,591	3,434	86,413

Sources: Based on data from Istat, Alps Crossing, Eurostat and ENAC.

Note: provisional data for 2015.

METHODOLOGICAL NOTE

1. Estimate of average freight rates: the methodology

The main goal of the survey on the international transport of merchandise is to collect the unit costs of transport for sufficiently homogenous groups representing 'standard shipment types' defined by the mode of transport used, the distance involved (country or geographical area of origin or destination), the direction of the flow and the type of cargo or merchandise.[3] Examples of standard shipment types are the import of crude oil from the Middle East by bulk sea transport or the export of food products by truck to the Iberian Peninsula.

In practice, prices can be defined in weight units (metric tonnes) or in cargo units (vehicle or container), more rarely in volume or by individual item. Whatever the unit used, the prices are always converted to rates per metric tonne for consistency with the data on foreign trade, which use that unit of measure (and by which they are multiplied to obtain the value of the service provided). Furthermore, a distinction is made between 'pure' freight rates and the other components, i.e. ancillary services (typically the loading and unloading of cargo) and agents' and brokers' fees.

The modes of transport are identified by looking at the homogeneity of the means of transport, merchandise and freight rates and, with the exception of transport through fixed installations such as pipelines),[4] they are:

1. Ship:
   - Liquid bulk: transport of petroleum and petroleum products and liquid chemical products.
   - Dry bulk: transport of fossil raw materials (coal, bauxite, iron ores etc.) and food commodities (grain and equivalents).
   - Container: transport of merchandise in containers.
   - General cargo: a residual category accounting for the transport by sea of merchandise that cannot be loaded into a container and does not fall under the category of liquid or dry bulk.
   - Ro-Ro (Roll on, Roll off): the transport by sea of an entire road vehicle (with or without its tractor unit).
2. Rail:
   - Container (either intermodal or combined): transport of 'unitized' loads, i.e. packed into a unit such as containers, swap-bodies or in the form of 'rolling motorways' (a type of rail freight in which the road vehicle, with or without its tractor unit, is loaded onto the train).
   - Traditional (bulk, conventional, wagon load): non-unitized cargo transported on dedicated rail cars.
3. Road: for this mode of transport the only distinction that can be made is the one involving freight rates: for Full Truck Loads (FTL) the prices are generally per vehicle and euro-denominated, while for groupage (LTL, less than truck load), when the vehicle is loaded with cargo from different clients and in highly variable quantities ranging from 100 kg to 5 tonnes, the prices are per weight.
4. Air.

Italy's trading partners are grouped by geographical area based on distance, and the grouping changes

[3] The number of standard shipment types that actually occur is much lower than the theoretical maximum given by all the possible combinations of the variables because many of the combinations do not occur in practice. For example, air freight is almost exclusively used for certain types of merchandise, in many cases the direction of the transport flow is not important, and so forth.

[4] The costs of transport via pipelines (for Italy, mostly gas pipes transporting imported methane) are estimated drawing on the information provided directly by the entities managing the pipelines and fall outside the scope of the survey. They will, however, be included starting from the survey for 2016.

with the mode of transport. The type of merchandise or cargo may refer to specific commodity sectors (as defined by the Standard Goods Classification for Transport Statistics, 2007) within a mode of transport, or to special ways of loading, e.g. groupage in road transport.

Once the standard shipment types to be used in the recording of unit costs have been defined, the interviews with transportation and logistics companies begin, divided by mode of transport. The identification of 'typical shipments' does not constitute sample stratification but, rather, the variable to be estimated and for which respondents provide an average assessment (mean unit rate). In fact, information on the same kind of shipping may be gathered from different categories of transport companies, and single operators can spread their activity over more than one mode of transport, thus providing data on more than one 'typical shipment'. Operators can be classified on the basis of three main characteristics of their business:

- carrier, i.e. entity directly handling the transport,
- the forwarder or the multimodal transport operator, and
- the intermediary (agent or broker) that manages the contracts of affreightment, especially for sea and air transport.

The names of the operators to be interviewed are drawn randomly from lists that have first been stratified according to company size as measured by turnover. The sampling lists are normally based on the records kept by trade associations and international organizations or those made available by specialized publications.

The survey was conducted among around 200 international transport operators on a quarterly or annual basis depending on the level of variability displayed by the type of transport.

Sample size is defined as a function of the variability of the unit costs of transport. The findings of the surveys conducted in previous years are used to determine the (minimum) sample size for the number of questionnaires to be administered to individual companies (each type of shipment has its own questionnaire) as well as the minimum number of companies to be included. Further information on sample selection methods, sampling lists, questionnaires and sampling error calculations can be found in other publications by the Bank of Italy.[5]

2. Estimate of the average freight rates: modes of transport

Data on road freight rates are collected both at full truck load, with prices normally per vehicle and euro-denominated, and at less than truck load (or groupage), where the quantities being transported are highly variable ranging from 100 kg to 5 tonnes and the prices are per weight. Groupage freight rates are much higher than full truck load ones as they normally entail the use of other vehicles to collect, distribute, store and handle the cargo; these auxiliary logistical activities have significant costs. Groupage rates tend to decrease as the weight of the load increases. Ancillary services are mainly in the form of freight forwarders' and agents' commissions, tolls and cargo handling fees.

Rail transport is divided into two main categories: intermodal and traditional. The data on freight rates are collected by the operators in euros per container for intermodal and euros per wagon (or full train) for traditional. The freight rates are then converted into euros per metric tonne by estimating the average load per container or wagon. Ancillary services are essentially cargo handling fees and agents' and freight forwarders' commissions.

Air freight is carried out not only through dedicated aircraft but also using the cargo holds of commercial airliners (but not low-cost carriers, which do not offer the service). While air transport is

[5] See the Bank of Italy's website at https://www.bancaditalia.it/statistiche/tematiche/rapporti-estero/trasporti-internazionali/index.html?com.dotmarketing.htmlpage.language=1.

marginal in terms of total volumes, its role in terms of value is not negligible. The goods transported by air are normally of high value and low volume. The freight rates are structured as a base rate plus additional charges, and are typically denominated in the currency of the exporting country; the data are collected as half-yearly averages and converted into euros per metric tonne. The main additional charge is fuel surcharge, which is frequently the most important element in determining the freight rate. Security surcharge has recently become important in relation to the security checks required for shipping. At the same time, airlines are showing a growing tendency to set all-in rates. Ancillary services are essentially represented by cargo handling fees and agents' and freight forwarders' commissions.

Container sea freight is a type of highly standardized liner shipping. The freight rate is structured as a base component, different for each type of container (20 ft, 40 ft and 40 ft high cube) plus some surcharges. Further differentiation of the container (e.g. dry box or open top) can constitute an additional charge. The other main surcharges are the Bunker Adjustment Factor (BAF), which covers fluctuations in the cost of fuel, and the Currency Adjustment Factor (CAF), which normally applies to changes in the exchange rate of the US dollar as rates are normally dollar-denominated, and is used by shipowners to hedge against risk. Other surcharges include those for war or piracy risk, port congestion, dangerous goods, and transit through the Suez and Panama canals. The freight rates are measured as quarterly averages in dollars per twenty-foot equivalent, or TEU (for other container sizes the rates are converted back into dollars per TEU). The cost per metric tonne can be calculated by estimating the average container load. Ancillary services mainly consist of Terminal Handling Charges (THC), i.e. the costs involved in loading and unloading the containers, and the International Ship and Port Facility Security surcharge, both applied in ports.

The survey is conducted quarterly among bulk sea transport operators; the sample includes shipowners, agents and some large importing companies and is augmented with information taken from specialized publications.[6] Moreover, freight rates are often based on time charter rather than on voyage charter and therefore the 'shipment types' are examined together with the respondents on the basis of ancillary information such as voyage time, loading and discharge time, fuel consumption, port costs and bunker costs. A database is therefore available for estimating the total freight rate per voyage. Once converted into prices per metric tonne per single voyage, the rates may be grouped into two types of cargo and four types of merchandise: a) liquid bulk, which is further broken down into petroleum and petroleum products versus chemical products, and b) dry bulk, which can be divided into grain and agricultural commodities versus coal and metal ores. Ancillary services are mainly port costs and agents' and shippers' fees and, for dry bulk, handling costs (the loading and discharging of the merchandise).

General cargo sea transport is used for residual categories of products for which neither container nor bulk shipping is possible. This type of transport is, therefore, difficult to standardize and normally not performed by liner shipping. The type of merchandise transported by general cargo is quite diverse and, consequently, so are the freight rates. For some products (e.g. building materials, timber and metal products), the freight rate is per weight, while for others (e.g. machinery and equipment) it is frequently set by volume or by item (but in any case converted into the price per metric tonne). This entails a high proportion of ancillary services, mainly in the form of loading and discharging. The data on the rates are collected as annual averages in US dollars. Ancillary services include port costs, agents' and shippers' commissions and handling costs.

Ro-Ro sea freight (Roll on, Roll off), which includes 'Motorways of the Sea',[7] is the transport of entire road vehicles (with or without their tractor units) and has some of the features of container shipping as both types of freight constitute unitized liner shipping. The base freight rate depends, among other

[6] 'The Drewry Monthly' (Drewry) and 'Shipping Statistics and Market Review' (ISL).

[7] 'Sea motorways' is a system of combined road-sea freight transport by means of Ro-Ro ships, the purpose being the transfer of a share of road transport from motorways to sea lanes.

things, on the kind of vehicle being transported (semi-trailer, trucks etc.). The main surcharges are those for changes in fuel costs, sleeping accommodation for the drivers, the handling of driverless vehicles and special transports (live animals or refrigerated vehicles). The data on freight rates are gathered as annual averages and are euro-denominated as this type of transport is by and large limited to the Mediterranean area. Ancillary costs are mainly those for cargo stowage and the storage of driverless semi-trailers in trailer.

3. Mode-of-transport adjustment of foreign trade data

One of the purposes of the survey is to adjust the mode of transport matrix of foreign trade data by volume and value to ensure a greater level of detail and better quality of the data on the demand for transport and to make up for some of the shortcomings of official statistics. Istat collects data on foreign trade only distinguishing between four modes of transport (sea, rail, road and air), with no further breakdown;[8] moreover, the quality of the data is affected by the respondents' statistical "myopia" (which is discussed below).

These data, therefore, need to be adjusted using a number of industry-specific datasets (Italian and international) on merchandise transport for which the main sources are:

- the data on transport collected and published on a regular basis by Eurostat for the European Commission's DG MOVE, [9]
- the CAFT[10] database produced every five years by Switzerland, Austria and France,[11] and
- Trenitalia data on import, export and international transit flows.[12]

By using such sources it is possible to allocate Istat's foreign trade data into the different types of transport identified for sea and rail freight. It is also possible to change the breakdown by mode of transport between the main four categories in order to remove the overestimate that structurally affects road transport to the detriment of the three other multimodal modes, especially rail.[13] In fact, the importing and exporting firms tend to identify the mode of transport on the basis of the means of transport used as the first or last link in the chain, the road truck, which often only performs feeder service (thus the statistical "myopia"). Finally, as regards EU data, it is possible to estimate the modal breakdown of transactions that fall under the minimum reporting threshold for which the information on the mode of the transport used is mandatory.

The assumption underlying the adjustment of the Istat matrix of trade flows is that the import and export totals, by quantities transported and by monetary value, are substantially accurate, save for small adjustments such as subtracting bunkerage (refuelling), for which it does not make sense to calculate

[8] Data on the share of merchandise shipped by container would be available, for sea freight and for non-EU trade only, but a comparison with other statistical sources shows that those data underestimate the share commanded by container ships to the detriment of the other types sea freight transport.

[9] For sea transport the sources are the statistics provided by the individual ports, which for Italy are the statistics on maritime transport in Italian ports compiled by Istat. These sources provide data on the types and quantities of merchandise loaded and discharged in Italian ports by country of origin and destination. Rail freight data are obtained from national statistics. For air freight, they are collected in all relevant airports.

[10] CAFT (Cross Alpine Freight Transport), https://www.bav.admin.ch/bav/it/home/temi/indice-alfabetico-dei-temi/trasferimento-del-traffico.html (only in Italian, German and French).

[11] The CAFT survey is coordinated by the Swiss Ministry of Transport and is based on vehicle counts and interviews carried out at border crossings, providing data on cross-alpine transport flows. Its precise and accurate statistical criteria make it a robust and reliable source of data for analysing cross-Alpine freight traffic, although the fact that it does not include Slovenian border crossing diminishes its importance.

[12] The data are broken down by Italian region of origin/destination, by foreign network of origin/destination, and by conventional versus intermodal transport.

[13] For multimodal transport the mode of transport reported is the dominant one, i.e. the one used for the longest stretch or for the international segment of the transport.

the cost of transport. Therefore, only the breakdown by mode of transport is changed, without significantly affecting the breakdown by geographical area or product.

4. Estimate of carriers' market shares by nationality

The estimate of the breakdown of trade volumes between Italian and foreign carriers is calculated for the various modes of transport using different sources: administrative ones for air and rail, and sample survey for sea and road.

For air transport, mainly external administrative source are used; the data come from the Italian Civil Aviation Authority (ENAC) and from Assoaeroporti, Italy's airport industry association, and provide information on the annual volumes transported by carriers, broken down by country of residence. The same applies to rail transport, for which the administrative data come mainly from Italy's rail safety agency ANSF and Istat.[14] Here data collection has only begun in recent years as a consequence of privatization in the sector. Moreover, the market shares only refer to the Italian stretch of the flows between Italy and abroad.

For road transport the data used are those collected as part on the Bank of Italy's survey on international tourism in Italy.[15] In counting the number of vehicles entering/leaving the country by road border crossing, a specific count is made for trucks, classified by size and licence plate nationality. The share held by resident carriers is then estimated by looking at the trade volumes of each road border crossing.

The estimate of market shares in sea transport relies on:

- the IHS Fairplay Sea-web database, which contains detailed information on the world fleet,[16] and
- the selection of a sample of ships/international flows recorded in a given period of time in a significant number of Italian ports.

More than 5,000 ships were included in the survey, accounting for over 20,000 transport flows. The sample represents a very high share of Italy's overall international freight traffic, accounting for over 80 per cent of transport flows, with peaks of 96 per cent for certain types of cargo.

Once the sample was extracted, the target population defined and the Sea-web database acquired, it was possible to identify the shipowner and the ship operator for each vessel.

The market share is then estimated for each port and each type of ship/load included in the sample, broken down by residence of the ship operator. The total market share for Italy is obtained by weighting the data for the single ports by the total quantities loaded and discharged.

[14] For the ANSF data, see its annual report on rail safety; for the Istat data, see its rail transport survey http://www.istat.it/it/archivio/79224 (only in Italian).

[15] Information on the data (including the microdata from the sample survey) and on the proceedings of conferences on international tourism in Italy are available on the Bank of Italy's website at http://www.bancaditalia.it/statistiche/tematiche/rapporti-estero/turismo-internazionale/index.html.

[16] For further information see the Sea-web site at http://www.sea-web.com/seaweb_welcome.aspx.