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Italian agri-food exports in the international arena

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Summary

We study the performance over the last fifteen years of exports of typical, Made in Italy agri-food products. First, we estimate the aggregate elasticities of exports values with respect to world imports, export prices and the prices applied by our competitors. Second, we show that aggregate estimates hide very different values of the elasticities at the single product level. Third, we calculate an index of sophistication for each Made in Italy agri-food exports, capturing its position in the different layers of world supply, showing that Made in Italy agri-food exports are shifting towards higher levels of sophistication. Finally, we compare the elasticities with the changes in sophistication. Our results show that the strategy of Italian exporters varies according to the type of product and to the degree of market completion. In some cases, Italian exporters contrast increasing world competition by raising the quality of their products or their sophistication content; in other cases, price competition is chosen , by keeping AUVs at lower levels than those of our competitors. But in nearly all cases, these strategies are successful in allowing Italy to defend and sometimes even to increase its world market shares, in spite of a growing world competition.

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1. INTRODUCTION

Made in Italy represents the most advanced segment of Italian exports with specific and distinctive attributes such as styling, labour skills, technology, and so forth. These attributes can contribute to add value within a set of total exports that are overall considered mature and basically exposed to mere price competition (Di Maio, Tamagni, 2008; Monti, 2005). The definition of Made in Italy (MiI) referred to agri-food exports applies mostly to Italian typical and worldwide highly reputed products. These goods identify with the Italian territory and recalls the Mediterranean diet including some of the most typical food products of Italy, or at least those who are acknowledged abroad as characterising the Italian agri-food sector (Ismea, 2012; Inea, 2009; Antimiani, Henke, 2005 e 2007).

These features can stem both from the nature of the agricultural produce - this is especially the case for fresh vegetables and fruit - and from traditional and peculiar processing techniques. However, one should be aware of two important elements when defining the agri-food MiI: 1) a lot of processed food that is clearly identified as "made in Italy" is produces starting from a high rate of imported agricultural products (i.e., pasta from durum wheat); 2) a non-irrelevant share of the agri-food MiI is composed by fresh agricultural products, that are internationally identified with the agricultural production of Italy, that are very stable in terms of positive net commercial balance and are considered a "cultural expression" of the territories where they are produced. This is especially the case of fresh fruits and vegetables. As a consequence of these two elements, the country identification of the MiI is not necessarily to be referred to the origin of the final product or to the process in itself, but rather it should be connected to the territorial links that are at the very base of the production of food, no matter if it is processed or not, or if it is made with imported raw material.

In world markets characterised by increasing competition, any specificity of the goods that can segment the market and smooth the pressure of competitors is valuable to exporters.

In this light, the aim of our research is to assess the performance of the agri-food Made in Italy exports products on the international arena and to get some insights on the factors that are influencing their position and degree of competitiveness.

To investigate this topic, we follow a two-step methodology. As a first step, we estimate the elasticities of a set of agri-food "Made in Italy" exports to the world demand and to the prices applied by the main competitors. This highlights the capacity of MiI exports to adjust to trends in world demand and to successfully engage competition with other suppliers.

The second step is about to assess to what extent products' attributes, measured by their level of so-called "sophistication" (Lall et al., 2006), affect export competitiveness of the agri-food made in Italy sector and its ability to compete in in the higher segments of world markets, thus, ensuring higher level of remuneration to resources.

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In the last section of the paper we compare the estimated elasticities with the analysis of the changes in the level of "sophistication" of each product, as expressed by the Prody index, between 1996 and 2011.

The paper is organized as follows: section 2 presents some descriptive data on MiI exports; section 3 describes the methodology; sections from 4 to 6 present the main results; section 7 concludes.

2. AGRI-FOOD MADE IN ITALY EXPORTS: A SHORT DESCRIPTION

Moving from trade data available in the UN Comtrade databank at 6 digit level (HS-6), we aggregated the over 700 items referred to agri-food into 95 macro-items and then from them we selected the 30 items included in the agri-food made in Italy exports[1]. This aggregate includes a mix of fresh produce (vegetables, tomatoes, grapes and the cluster "apples, kiwis and pears") and processed food (all the other items, as shown in table 1). The group represents a rather large share of the total Italian agri-food exports: 71% of the total in 2010/11, it was less than 68% in 1996/97 (table 1). As mentioned in the previous section, the common feature of these is in that they recall the Italian diet and life-style; their net trade balance is mostly positive even if there are few exceptions (one of the most noticeable is olive oil whose net trade balance is negative).

In the observed period of time, bottled wine (< 2 lts) shows by far the largest share of the export values (16.4% in 2010/11, 13.9% in 1996/97), In 2010/11 wines are followed, at a distance, by pasta (6.5%), sauces and other condiments (6.4%) and canned tomatoes (6.2%). Of these products, sauces and other condiments show the largest increase in the share, featuring in 1996/97 a value of 4.2%. Actually, all the other major items represent quite a stable share of the total export values over the period observed, as a result of basically stable trends in export flows, with a limited expansion over time, especially when compared to minor flows which are relatively more dynamic.

Looking at the fresh component of the agri-food Made in Italy exports, data show a sort of steadiness of the shares (as in the case of "apples, kiwis and pears") if not a certain degree of reduction (fresh vegetables and grapes), so that their position in the ranking of the 30 MiI products becomes relatively low.

Looking at the export dynamics, the average annual variation of the export values at current prices are all positive, with the only exception of the non-virgin olive oil.

In the same table we considered also the specialisation index of Balassa (Revealed Comparative Advantage – RCA). The index formula is as follows:

$$RCA_{i,j} = \frac{\frac{x_{i,j}}{x_j}}{\frac{x_{i,w}}{x_w}}$$

Where $X_{i,j}$ is the exports of the item i of the country j; X_j the total agri-food exports of the country j; $X_{i,w}$ is the world exports of the good i and e X_w the world agro-food exports. Clearly enough, the index for all the agri-food made in Itay items is greater than 1, indicating specialisation of the country for these items (except confectionery products for which Italy does not show a revealed competitive advantage, with a value of Balassa index of 0.9). However, the value spans from 1.2 for prepared vegetables to 28.4 for virgin olive oil. The lower values (around 1 and 2) are relative to fresh and prepared vegetables as well as prepared fruits and fruit juices; while for products such as pasta, canned tomatoes, grated cheese, virgin olive oil, grapes and wine < 2 lts, sparkling wines and vermouth, Italy shows higher level of revealed competitive advantage (index values above 10).

More interestingly, the variations of RCA show the trends in the specialization pattern of the country relative to world specialization. Index variations are mixed, with some products that show a negative figure while other facing a positive one with varying intensity. Particularly high rates of increase in specialisation

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[1] The exports are referred to 122 countries (world).

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are recorded for many cheese categories, virgin olive oil, chocolate products, sauces and other condiments, mineral water and wine < 2 lts. On the contrary, for some products such specialisation significantly decreases by time: fresh tomatoes and vegetables, processed coffee and rice, non-virgin and mixed olive oils, confectionery products, prepared fruit and wine > 2 lts. For all these products, Italy is de-specialising on the international arena, due to a change of the shares held by the old competitors or due to the entry of new competitors on the world market.

Table 1. Agri-food Made in Italy exports: shares and variations (%).

	shares on total made in Italy		export var. %	RCA	var. RCA
	2010/11	1996/97	year av. var.	2010/11	%
fresh cheese	2,0	0,7	15,1	9,0	244,4
grated cheese	0,9	0,7	9,0	12,3	47,9
blue cheese	0,5	0,7	4,4	9,6	73,3
other cheese	5,3	4,9	6,8	5,0	110,9
fresh tomatoes	1,0	1,1	4,2	1,2	-18,6
fresh vegetables	4,3	5,5	3,6	2,1	-24,3
grapes	2,9	4,3	3,3	11,6	17,7
apples, kiwis and pears	5,5	5,5	6,6	6,8	63,1
processed coffee	3,8	2,1	11,6	6,2	-45,4
processed rice	2,1	3,1	2,9	2,2	-81,7
virgin olive oil	4,6	4,1	6,9	28,4	147,7
non-virgin olive oil	1,1	3,0	-1,4	9,7	-47,7
mixed olive oil	0,3	0,4	2,4	9,0	-37,8
Meat cuts	2,0	1,6	7,5	4,4	43,2
chocolate products	4,1	3,6	7,1	3,0	70,4
fresh pasta	2,8	2,6	6,5	8,1	0,9
dry pasta	6,5	7,8	5,2	20,8	12,5
confectionery products	2,2	2,8	5,1	0,9	-30,2
bakery products	4,6	3,8	7,5	3,1	10,1
canned tomatoes	6,2	6,3	5,9	13,5	18,8
prepared vegetables	2,1	2,1	6,6	1,2	13,5
prepared fruit	1,9	3,4	2,0	1,7	-60,7
fruit juices	2,5	3,0	4,9	2,5	5,4
sauces and other condiments	6,4	4,2	9,5	1,5	60,7
ice creams	1,2	0,9	7,6	4,1	15,3
mineral water	1,9	1,1	11,0	3,1	78,6
sparkling wine	2,5	2,1	8,0	18,7	23,0
wines < 2 lts	16,4	13,9	8,0	11,3	75,8
wine > 2 lts	1,8	3,3	2,2	5,4	-24,8
vermouth	0,8	1,3	2,1	15,2	26,3
Total Made in Italy	100,0	100,0	-		
Total agrifood exports	71,2	67,9	-		

With regards to the commercial partners, agri-food Made Italy exports are destined especially to EU countries: Germany, France and UK in the first place. However, two non-EU countries are important in the agri-food trade: Switzerland (as a border country) and USA as an important business partner. Other

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important partners , with growing shares as importers, are China, Japan, Korea, Russia and the more recent EU Member States (East-European countries).

Table 2 shows the first five export products and their destination. The table highlights two interesting aspects: the change of position in the ranking of the most important MiI export products and also the change in the share over the total. For example, wines < 2 lts. keep the first position, and the total share of the first 5 destinations stays around 11%. On the contrary, pasta reduces its share from 4.7% to 4%, while canned tomatoes shift from the third to the fourth place, and see their shares reducing from 3.9% to 3.3% on the total MiI exports. All in all, there is a variety of situations and behaviour that is worth to analyse more in depth. For all the main flows Germany, France and UK are featured as the main buyers. For some of the items, like wines < 2 lts, the flows shift from Europe to non-European countries (USA and Canada). However Japan disappears from the first positions for wines, while keeps its position in the case of pasta and grows in the ranking for canned tomatoes.

Another important aspect of this junction between items and partners is the increase in the distance of sales for fresh products such as "apples, kiwis and pears", for which Russia becomes and important buyer.

It must be noted, though, that the category of fresh products reduces its importance in the main agri-food Made in Italy exports: the item "fresh vegetables" disappears from the highest positions in the ranking, whose destinations were mainly European countries, in favour of another processed item /sauces and other condiments", that ends up third in the ranking and reaching farther markets (USA).

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Table 2. The first 5 items in the agri-food Made in Italy exports and their main destinations.

2010/11	% on Mil	% on Total	1996/97	% on Mil	% on Total
WINES < 2 lts			WINES < 2 lts		
USA	3,9	2,8	Germany	4,9	3,3
Germany	3,3	2,4	USA	3,1	2,1
United Kingdom	2,1	1,5	United Kingdom	1,6	1,1
Canada	1,2	0,8	Switzerland	0,8	0,6
Switzerland	1,1	0,8	Japan	0,6	0,4
Total 5	11,5	8,2	Total 5	11,1	7,5
PASTA			PASTA		
Germany	1,2	0,9	USA	1,4	0,9
France	0,9	0,6	Germany	1,1	0,7
United Kingdom	0,8	0,6	France	0,9	0,6
USA	0,6	0,4	United Kingdom	0,7	0,5
Japan	0,4	0,3	Russia	0,6	0,4
Total 5	4,0	2,8	Total 5	4,7	3,2
SAUCES AND OTHER CONDIMENTS			CANNED TOMATOES		
Germany	1,2	0,8	United Kingdom	1,4	0,9
France	0,7	0,5	Germany	1,3	0,9
United Kingdom	0,6	0,4	France	0,6	0,4
USA	0,5	0,3	Netherlands	0,3	0,2
Spain	0,4	0,3	Japan	0,3	0,2
Total 5	3,3	2,3	Total 5	3,9	2,7
CANNED TOMATOES			APPLES, KIWIS AND PEARS		
Germany	1,3	0,9	Germany	3,0	2,0
United Kingdom	1,1	0,8	Spain	0,3	0,2
France	0,6	0,4	France	0,3	0,2
Japan	0,4	0,3	United Kingdom	0,3	0,2
USA	0,3	0,2	Austria	0,2	0,1
Total 5	3,6	2,6	Total 5	4,1	2,8
APPLES, KIWIS AND PEARS			FRESH VEGETABLES		
Germany	1,8	1,3	Germany	2,6	1,8
Spain	0,6	0,4	France	0,8	0,5
France	0,3	0,2	Austria	0,5	0,4
Russia	0,2	0,2	Switzerland	0,5	0,3
United Kingdom	0,2	0,2	United Kingdom	0,3	0,2
Total 5	3,1	2,2	Total 5	4,6	3,1

3. METHODOLOGY

Understanding the determinants of international trade is one of the key research questions in economics. The interest on the causes and consequences of international trade goes back in time at least to the Mercantilists, and it never shrunk. One particular aspect of this line of research relates to the elasticity of demand for imports and exports with respect to economic activity, relative prices and a possible host of other factors. Notions like the Marshall-Lerner conditions – the conditions on the price elasticity of demand for exports and imports that need to be satisfied for a devaluation to improve the trade balance – and the J-curve effect – suggesting that in the short run the Marahll-Lerner conditions are unlikely to be satisfied, but they

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are in the long run – are indeed part of the basic analytical tools not only of research economists but also of policy makers.

Aside from theoretical analyses, empirical investigations of the determinants of the export performance are often a basic pillar on which building a country's trade policy. Specializing in the export of goods with a low price elasticity and with a high elasticity of demand from fast growing countries is often a recipe for economic success. Indeed, econometric analyses of country and product specific export demand elasticities have long tradition in economics, going back at least to Adler (1946) and Horner (1952). More recent examples include, among others, the estimates of short- and long-run elasticities of exports and imports for the G7 countries in Hooper et al. (2000) and those of US import and export at the sector level by Mann and Pluck (2007).[2] A vast strand of literature has also focused on country level imports and exports of agricultural products, in particular commodities.[3] Overall, the estimates of export demand elasticities obtained in the literature are quite heterogeneous, depending on the goods, countries and time periods under scrutiny. However, a common view in the most recent literature is the importance of conducting analyses at a narrow sector level, to reduce the impact of changes in product quality.

For this reason, our estimates are based on a large data set of Italian exports of 95 food and agricultural products towards the 49 largest trade partners. The econometric specification follows Mann and Plück (2007), where the annual growth rate of each product's exports on each customer country is a function of two distinct sets of variables, respectively catching the short and the long run reactions:

$$\Delta\ln(export_{ijt}) = \beta_0 + \beta_1 \Delta\ln(export_{ijt-1}) + \beta_2 \Delta\ln(import_{ijt}) + \beta_3 \Delta\ln(import_{ijt-1}) + \beta_4 \Delta\ln(AUVexp_{ijt}) +$$
$$+ \beta_5 \ln(\Delta AUVimp_{ijt}) + \beta_6 \ln(export_{ijt-1}) + \beta_7 \ln(import_{ijt-1}) + \beta_8 \ln(AUVexp_{ijt-1}) + \beta_9 \ln(AUVimp_{ijt-1}) +$$
$$+ \beta_{10} Y_t + \alpha_{ij} + \varepsilon_{ijt}$$

where:

ΔX is the annual variation of the generic variable X; $ln(export_{ijt})$ is the logaritm of the Italian exports of product i towards country j in year t; $ln(AUVexp_{ijt})$ is the logaritm of the Average Unit Values (AUV) of Italian exports of product i toward country j in year t; $ln(import_{ijt})$ is the logaritm of the total imports of the product i from the country j in year t; $ln(AUVimp_{ijt})$ is the logaritm of the AUV of the imports of product i from the country j in year t; Y_t is a dummy variable per each year t; α_{ij} is a dummy variable per each product i and country j; ε_{ijt} is a zero-mean error term.

The estimated coefficients can be interpreted as follows:

  - β_1 measures the inertia of Italian exports;
  - β_2 is the instant elasticity of Italian exports to the import demand;
  - $\beta_2 + \beta_3$ is the short-run elasticity of Italian exports to the import demand;
  - β_4 is the short-run elasticity of the Italian exports to the export AUV;
  - β_5 is the short-run elasticity of the Italian exports to the import AUV;
  - $-\beta_7/\beta_6$ is the lung-run elasticity of the Italian exports to the import demand;
  - $-\beta_8/\beta_6$ is the long-run elasticity of the Italian exports to the export AUV;
  - $-\beta_9/\beta_6$ is the long-run elasticity of the Italian exports to the import AUV.

The model is estimated using the procedure suggested by Arellano and Bond (1991) for dynamic panels.

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[2] See also Sawyer and Sprinkle (1996), for a survey of the previous literature.
[3] See for example Devadoss et al. (1988) and, more recently, Reimer et al. (2012).

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Moving to the sophistication concept, it is defined as the content of a good in terms of technology, design, quality, branding, scale economies and any other factors affecting its value (Lall *et al.*, 2006). The sophistication content of a product can be indirectly measured by the per-capita GDPs of the exporting countries, through the Prody index (Lall *et al.*, 2006; Hausmann *et al.*, 2007 The Prody index associated to each good (or set of goods) is defined as the sum of the per-capita GDP of all the countries exporting that good,where each country's GDP is weighted by a measure of the trade specialisation of the country in that item (expressed by the index of the revealed comparative advantages – RCA, normalized by the sum of RCA of all exporting countries). Formally:

$$Prody_i = \sum_j s_{ij} GDP_j$$

where $s_{i,j}$ is the weighting factor of the per capita GDP of each country j exporting the item i and it is given by:

$$s_{i,j} = \frac{RCA_{i,j}}{\sum_j RCA_{i,j}}$$

The index produces a ranking of values that is interpreted as a relative measure of the content of attributes that better remunerate inputs. .

The index, though relatively new, has already been applied to different sets of exports -the Chineese exports (Rodrick, 2007); the Portoguese exports (Lebre De Freitas and Salvado, 2009); the full vector of Italian exports (Di Maio e Tamagni, 2008); as well as, to the Agro-food exports (Carbone and Henke, 2012)- with encouraging results.

In this paper, we apply the Prody index to agri-food products that are defined also by the quality level within each category. Following Minondo (2007), for each product we considered two levels of quality according to the median world-level value of the export AUV and then apply the usual formulaFormally:

$$Prody_{iq} = \sum_j \frac{RCA_{i,jq}}{\sum_j RCA_{i,jq}} GDP_j$$

where *q* indicates the different level of quality of the exports (high and low), and all other expressions are as defined above.

Combining the two different kind of analysis – the study of the export elasticities and the export sophistication – we can jointly consider, on the one side, the ability of Italian exports to adjust to trends in costumers'demand and to competitors supply and, on the other side, the ability of MiI exports to compete on markets where price competition is less intense and exports are, hence, more rewarding. This exercise allows us to classify the agri-food "Made in Italy" exports in two major categories. Some products are characterised by a high and increasing value of the Prody index (sophistication), and for them the export elasticity to the world demand is relatively low. This behaviour is consistent with the high quality segment of the world demand that some agro-food exports address. For other products, the increase of the sophistication is, instead, associated with a relevant reactivity to the dynamics of the import demand. In these cases Italian exporters can take good advantage of the market opportunities, but they are also potentially exposed to the negative effects of an aggressive international competition.

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4. **ELASTICITIES OF AGRI-FOOD MADE IN ITALY EXPORTS**

Measures of the short- and long-run elasticities of Italian exports from the evolution of world demand allow a better understanding of the strength and weaknesses of our agri-food international specialization. A high elasticity with respet to world demand, for example, witnesses the ability to single out the fastest growing economies and benefit from the different country-specific dynamics. Clearly, it also implies a higher vulnerability during recessions.The elasticity with respect to relative prices is also a crucial characteristic of our exports. Indeed, when exporters enjoy some degree of market power, the total value of aggregate exports is less affected by changes in Italian export AUVs or in the AUVs of the imports of our clients from our competitors.

In Table 3 we present the values of the average short- and long-run elasticities with respect to world demand and prices, obtained from the estimation of the econometric model described in Section 3 on a sample of yearly data on exports to our 46 major trade partners betweeen 1995 and 2011, distinguishing between MiI and other agri-food products. All estimates are statistically significant at the 1% level.

The estimated instant elasticity of MiI agri-food exports is 0.40, a value higher than that for other agri-food products (0.33), though the difference is no statistically significant. This means that a 10% increase in the total value of agri-food imports of our major trade partners from all world countries determines immediately a 4% increase in the value of our MiI exports. The estimate of the short-run elasticity – that measures the total effect after two years – implies that such effect raises to 5.4%. For the non MiI agri-food products, the short-run impact is lower, at 3.9%, and the difference between the two elasticities is in this case statistically significant at the 5% level.

The value of 0.09 of the short-run elasticity with respect to export AUVs implies that a 10% rise of Italy's export prices determines a reduction in total revenues of 0.9%, a small value also in comparison to similar analyses for other sectors (e.g., Hooper *et al.*, 2000). In the case of non MiI agri-food produtcs, this elasticity is slightly higher (0.12), plausibly becasue of a lower market power, but the difference is not statistically significant. In the case of the elasticity with respect to average AUVs of imports of our trade partners, the short-run elasticity is slightly higher (0.12) for MiI products, and lower for other agri-food producs (0.10).

Consistent with economic theory, long-run elasticities are higher than instant and short-run elasticities. Table 3 shows that a 10% increase in world import of MiI agri-food products determines a raise in Italian exports of 7.5% (an elasticity of 0.75), a high value, although smaller than unity. As expected, the elasticity in the case of non MiI agri-food products is lower (0.62), and the difference between the two values is statistically significant. Long-run elasticities with respect to Italy's export AUVs and the average import AUVs of our trade partners are very similar in the case of MiI products, respectively -0.65 e +0.69, and close to those estimated by Hooper *et al.* (2000) for a set of manufacturing products. In the case of non MiI agri-food products, the long-run elasticity with respect to export AUVs is instead higher, at 0.86.

Table 3. Export elasticirties of Made in Italy agrifood exports.

		Made in Italy	Others	Total
β$_2$	instant elasticity of Italian exports to the import demand	0,40	0,33	0,36
β$_2$ + β$_3$	short-run elasticity of Italian exports to the import demand	0,54	0,39	0,44
β$_4$	short-run elasticity of the Italian exports to the export AUV	-0,09	-0,12	-0,13
β$_5$	short-run elasticity of the Italian exports to the import AUV	0,12	0,10	0,11
-β$_7$/β$_6$	lung-run elasticity of the Italian exports to the import demand	0,75	0,62	0,68
-β$_8$/β$_6$	long-run elasticity of the Italian exports to the export AUV	-0,65	-0,86	-0,83
-β$_9$/β$_6$	long-run elasticity of the Italian exports to the import AUV	0,69	0,65	0,68
Obs.		15,202	23,294	38,496

The elasticities presented so far are average values. However, we may expect significantly different values across products, depending on the product capacity to match consumers' needs and the degree of market power gained in different sectors and countries. To gauge a sense of these differences, we have estimated the econometric model of Section 3 separately for each MiI agri-food products.

Figure 1 presents the short- and long-run elasticities of Italian exports of each MiI agri-food product with respect to total import of that same product by our 46 major trade partners.[4] In the short-run, with the only exception of the value estimated for confectionery products (that is not statistically diferent form zero), all other elasticities are positive. The largest values are those of ice creams, bakery products, fruit juices and fresh and prepared vegetables (excluding tomatoes). For these products, the ability of Italian exports to satisfy a short-run increase in foreign demand is indeed high. Products with the lowest elasticities are instead processed cofee, chocolate products, blue, grated and fresch cheeses, mixed olive oil, processed rice and sauces and other condiments. Also sparkling wines and wines in large bottles show fairly small elasticities.

In the long-run, elasticitie are on average larger. With the exception of blue cheese (that shows a negative value, probably due to some export dynamics that are not adequately captured by the econometric specification), all other products show elasticities ranging from slightly below 0.5 for sauces and other condiments to values above unity for ice creams, mixed olive oil and non-virgin olive oil, fruit juices, vermouth, sparkling wines and wines in large bottles. In these sectors, exporters are therefore able to successfully exploit the long-run dynamics of foreign demand. The smallest values are, instead, those of processed rice, virgin olive oil and of processed coffee. Figure 1 also excludes fresh and canned tomatoes and grapes, whose estimates of the long-run elasticities are statistically and economically insignificant.

Interstingly, although the correlation between short- and long-run elasticities with respect to foreign demand is positive (0.37), it is not very strong. The instant reaction of Italian exports to changes in world demand should therefore be interepreted with caution, since they could lead to different patterns in the longer run.

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[4] In the case of few products, econometric estimates did not provide statistically and economically significant results; for this reason we have decided to drop them from this and the following Figures.

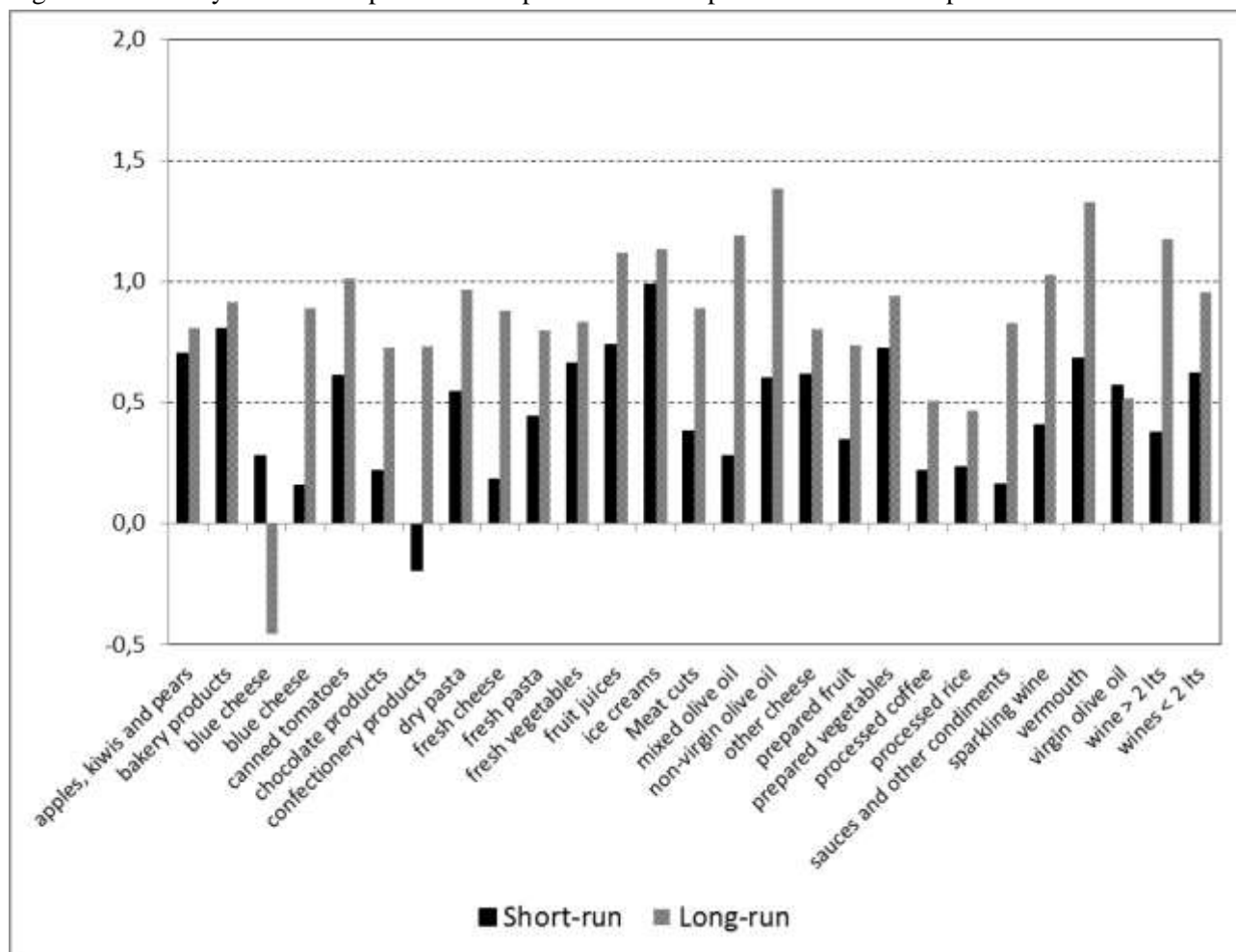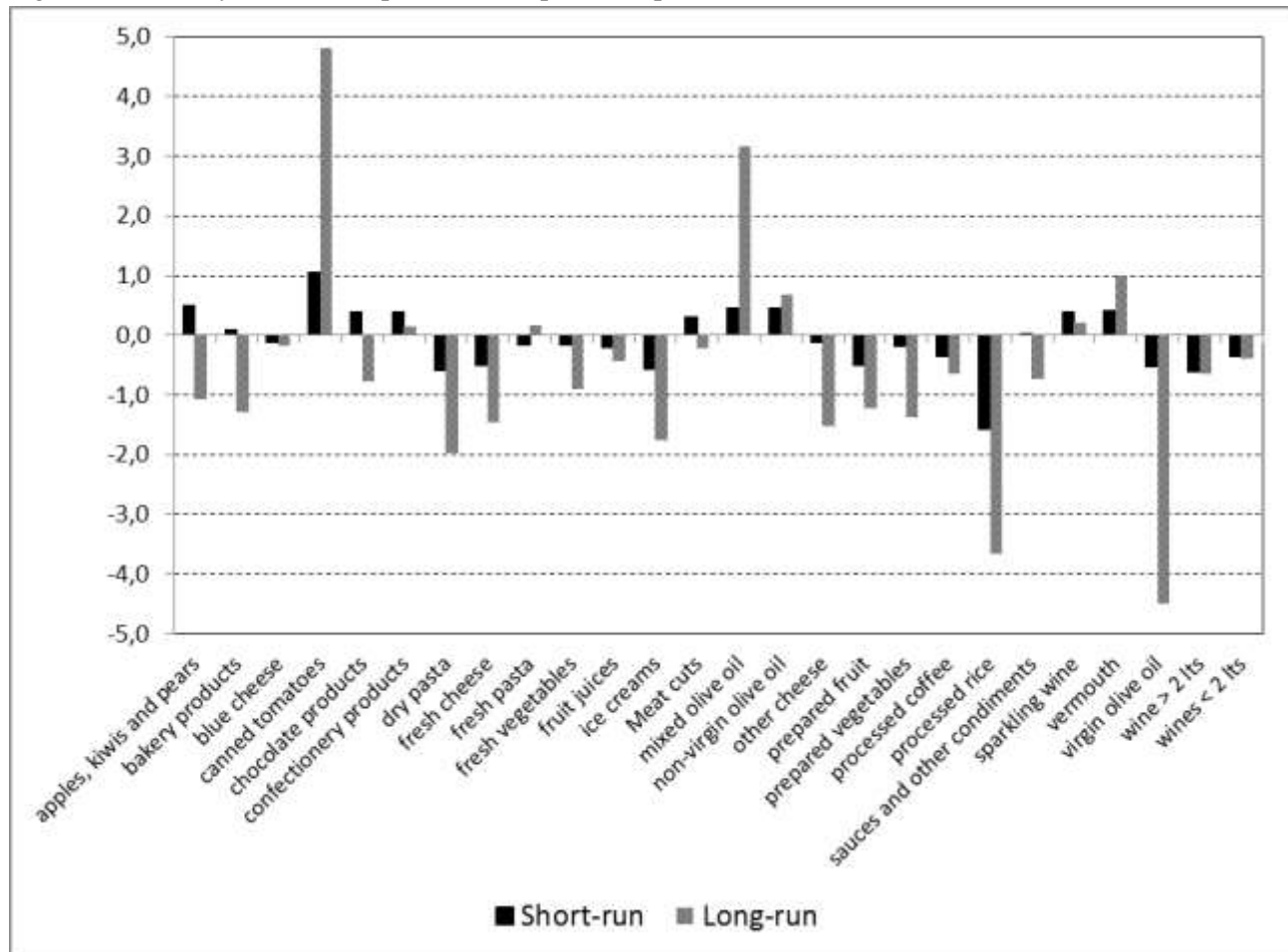Figure 1: Elasticity of Italian exports with respect to world import demand of each product.

Figure 2 shows the short- and long-term elasticities of Italian exports of MiI agri-food products with respect to export AUVs. In the short-term, the average value of -0.09 presented in Table 3 hides quite different trends. Depending on the product, the estimated elasticities range from values well below -1, as in the case of processed rice, to values larger +1, as in the case of canned tomatoes and mixed olive oils.

For 15 products (including all cheeses, dry pasta, virgin olive oil and wines, except sparkling wines) the short-run elasticity to export AUVs is negative. In this case, an increase in export prices results in a more than proportional reduction of the quantities sold abroad, determining a contraction of overall exports revenues. For the remaining 11 products (including vegetables and sparkling wines) the elasticity is instead positive, indicating that an increase in prices translates into a short-term revenue growth.

In the long-run, elasticities to export AUVs are even more negative, consistent with the hypothesis that over a longer time the market power of exporting firms is weaker, because buyers can change their consumption habits and other exporting countries may adopt more aggressive pricing strategies. Only four products show a statistically and economically significant positive elasticity: mixed olive oil, non-virgin olive oil, canned tomatoes and vermouth. Products that suffer most from a long-run increase in their export price are virgin olive oil, processed rice and dry pasta, followed by all cheeses, apart from grated cheese.

Figure 2: Elasticity of Italian exports with respect to export AUVs.

Finally, Figure 3 shows the short- and long-run elasticities of Italian exports of MiI agri-food products with respect to AUVs of imports of the same product by our main trade partners.

Also in this case, the trends are quite different depending on the product considered. In the short-run, values range from -0.4 for mixed olive oil, to a little more than 0.5 for prepared fruit and ice creams. While a positive value of this elasticity implies that Italian exports are favored by an increase in the prices of imports from our competitors, a negative value indicates that they decrease with the increase in those prices. Although this is less common, it is ideed possible. If, for example, the demand for French sparkling wine is particularly unelastic, while family's total expenditure for sparkling wines is relatively constant, an increase in the price of French sparkling wines would result in a reduction in the consumption of Italian sparkling wines. As expected, for most products the elasticity with respect to the AUVs of imports from our competitors countries is positive or very close to zero.

In a nutshell, our results show that although Italian exporters of MiI agri-food products enjoy some degree of market power, price competition remains a relevant issue, suggesting the existence of a significant trade-off between strategies based on quality and brand recognition and strategies based on prices.

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Figure 3: Elasticity of Italian exports with respect to AUVs of imports of our trade partners.
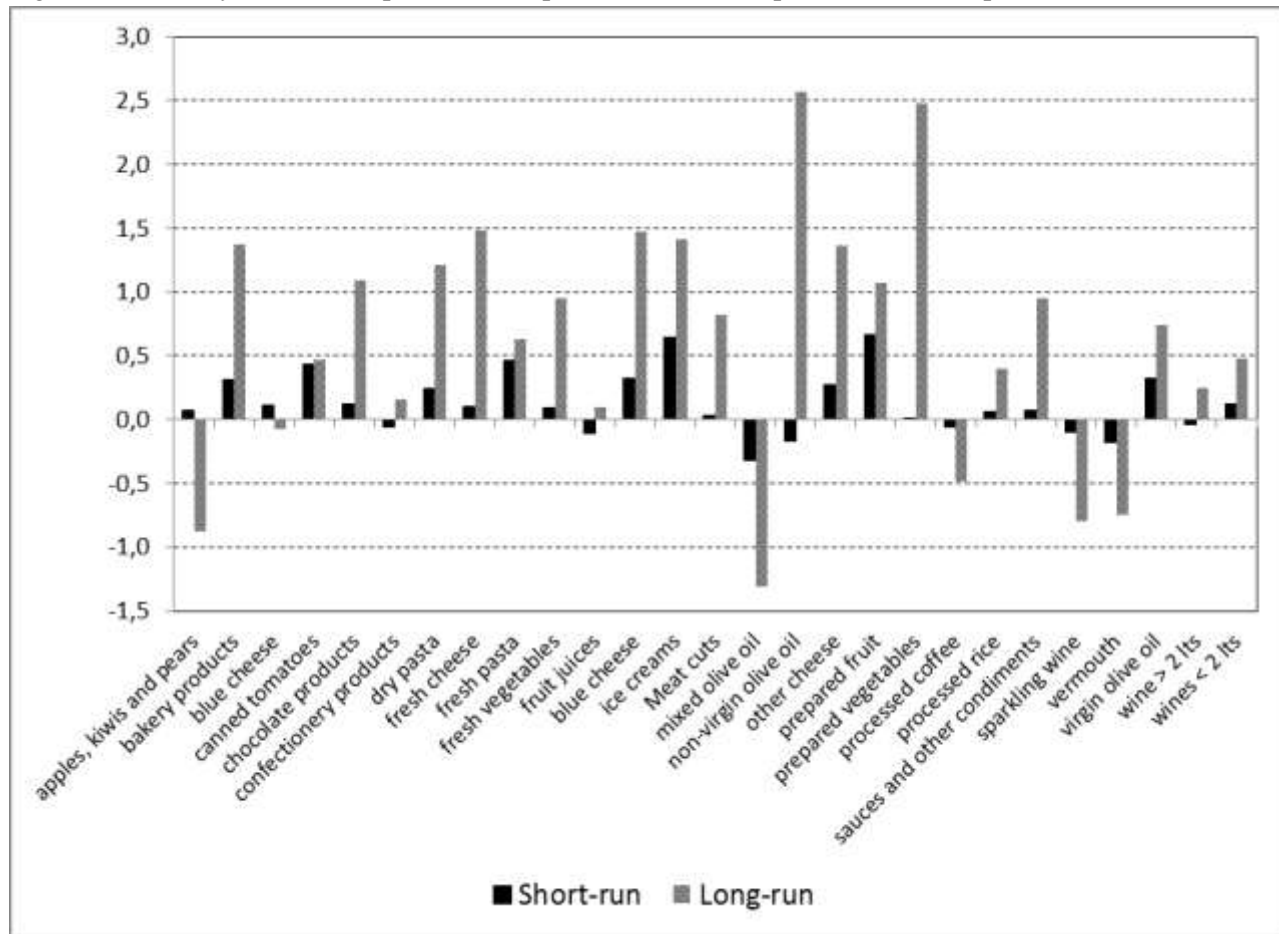
Looking at the long-run elasticities, there are few products showing significant negative values are processed coffee, fresh fruit and vegetables (excluding grapes), mixed olive oil, vermouth and sparkling wines. For many products, the estimated elasticity is positive and larger than unity, indicating a strong ability of our exporters to take advantage from any increase in the price of our competitors and, conversely, the risk of loosing market shares if they reduce their prices. In the long-run, the elasticites are particularly high for non-virgin olive oil, prepared vegetables, cheeses, excluding blue cheese, and ice creams.

Although the relationship between the long-run elasticities of Italy's export AUVs and import AUVs from our competitors is, as expected due to the growth of the relative proces of Italian products, negative and statistically significant (since a rise in export AUVs has the same effect of increasing relative prices as a reduction of our competitiors' AUVs), it is not particularly strong. Similarly weak is the relationship between the short- and long-run elasticities to export and import AVUs.

Finally, the long-run elasticity of exports with respect to import and export AVUs shows no correlation with the incidence of each product on total exports at constant prices. In other words, contrary to what one might expect, the elasticities with respect to AVUs are not higher in absolute value for the products that represent a significant share of our MiI agri-food exports.

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5. THE SOPHISTICATION LEVEL OF THE MADE IN ITALY AGRI-FOOD EXPORTS

As underlined in the methodological section, the Prody index is used as a measure of the sophistication of a set of goods. Table 4 shows the values of the index for 1996-97 and 2010-2011 agro-food MiI exports, as well as the rankings built upon these values and the absolute and percentage variations of the index.

Table 4. Prody Index for the *Made in Italy* agri-food products.

products	1996-97 ($)	ranking	2010-11 ($)	ranking	variation ($)	%
herborinated cheese LQ*	27.759	1	47.196	1	19.437	70,0
grated cheese	19.988	16	40.636	2	20.649	103,3
processed coffee	19.481	17	34.534	3	15.053	77,3
fresh cheese	26.754	2	34.209	4	7.455	27,9
fresh pasta	20.548	14	33.422	5	12.874	62,7
other cheese	26.742	3	30.669	6	3.927	14,7
sparkling wine LQ**	10.732	29	27.592	7	16.860	157,1
chocolate products	24.133	5	27.254	8	3.121	12,9
confectionery products	21.070	10	27.497	9	6.427	30,5
bakery products	24.897	4	27.216	10	2.320	9,3
Meat cuts	20.086	15	26.350	11	6.263	31,2
sauces and other condiments	21.808	9	25.873	12	4.065	18,6
ice creams	23.136	7	24.994	13	1.858	8,0
virgin olive oil	19.314	18	24.045	14	4.731	24,5
apples, kiwi and pears	23.520	6	22.906	15	-614	-2,6
fruit juice	14.859	22	21.479	16	6.620	44,6
vermouth LQ**	18.636	19	20.118	17	1.483	8,0
fresh tomatoes	22.971	8	19.409	18	-3.563	-15,5
fresh vegetables	17.284	20	18.358	19	1.074	6,2
mixed olive oil LQ*	10.203	30	17.782	20	7.579	74,3
canned tomatoes LQ**	15.013	21	16.818	21	1.805	12,0
non virgin olive oil LQ*	20.921	12	16.802	22	-4.119	-19,7
prepared vegetables LQ**	13.666	24	16.583	23	2.917	21,3
wine <2lt LQ*	20.606	13	15.827	24	-4.780	-23,2
mineral water LQ**	13.202	26	15.810	25	2.608	19,8
dry pasta LQ*	13.938	23	14.201	26	263	1,9
wine>2 lt LQ**	10.915	28	13.346	27	2.431	22,3
prepared fruit LQ**	12.406	27	11.555	28	-851	-6,9
grapes LQ**	13.395	25	10.237	29	-3.159	-23,6
processed rice	21.028	11	6.065	30	-14.963	-71,2

Source: our elaborations od UN-Comtrade e World Bank data.
    *Low quality products at 2010-11.
    ** Low quality products both at 1996-97 and at 2010-11.

Focusing on the Prody values at 2010-11, it is easy to see that the range covered is quite wide, spanning from a maximum of about 47,000 USD for herbal cheese, to a minimum of about 6,000 USD for

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processed rice. Figure 4 shows Prody values for the 95 items of the agri-food exports out of which the 30 MiI were selected. The darker columns in the figure are the MiI exports. From this figure it is possible to gain two important insights. First, it is clear that MiI products embrace almost the entire range of Prody values, in other words, MiI exports show significantly different level of sophistication compared with the entire agri-food vector of exports. Nevertheless, it is clear that MiI exports are predominantly located in the upper half of the distribution (>15,000 USD). In other words, MiI mostly includes sophisticated agri-food items. Summing-up, the market segments in which these products are competing are high quality and highly differentiated (on the base of all the attributes included in the sophistication concept); however, there are also some products for which price competition is relatively more important.

Figure 4: Agri-food products' ranking of sophistication and the positioning of Made in Italy.
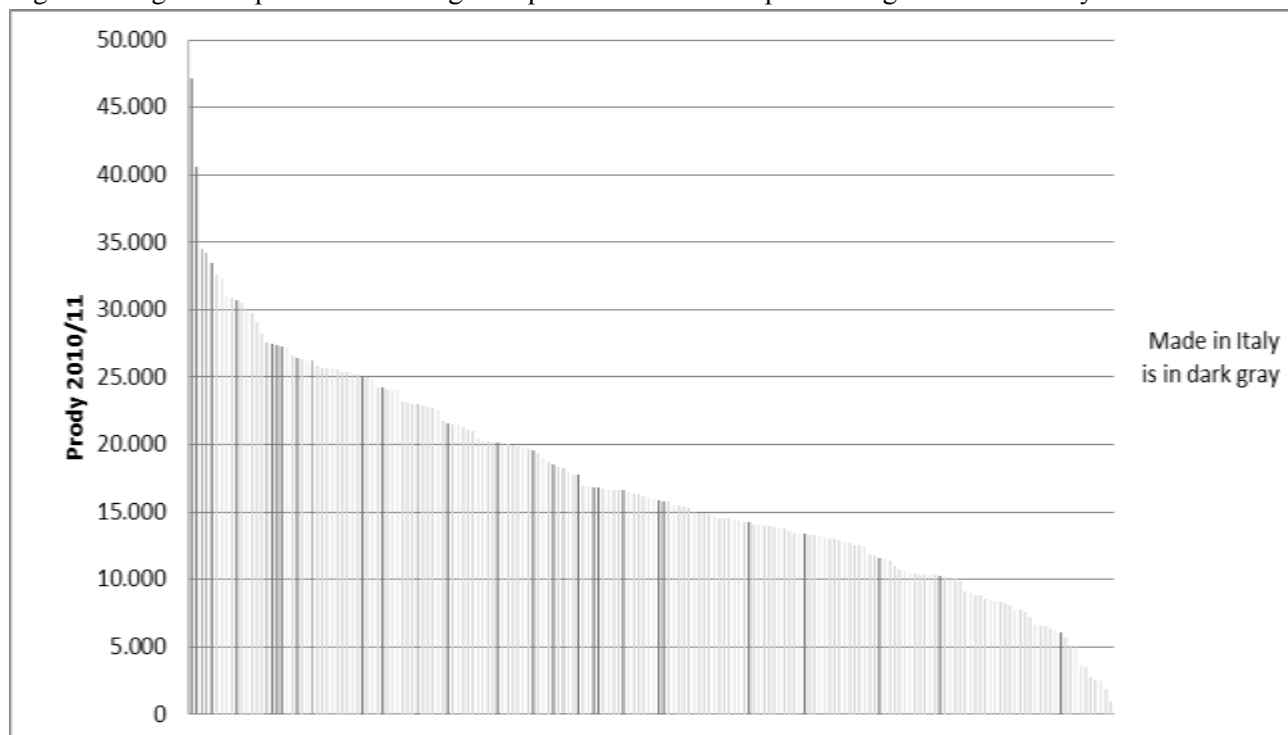
It is interesting to highlight that at the top of the ranking there are highly processed products such as cheese, bakery, sparkling wines, chocolate products, confectionery, processed coffee, and others, for which branding, packaging and market segmentation are all cues of competition. On the contrary, at the bottom of the ranking there are less processed, simpler products such as preparation of fruit and vegetables, fresh fruit, canned tomatoes, olive oils, wine, processed rice, for which sophistication seems to be a less important key to compete in the world markets.

Fully consistent with the observed ranking, it can be observed that at the bottom of the ranking there are many products for which the Italian exports are classified as Low quality according to their AUV (see Section 3. These are, overall, 8 products with AUVs below the world median for the entire period (prepared vegetables, canned tomatoes, grapes and prepared fruits, and also mineral water wine> 2 lt., sparkling wine and vermouth); plus 5 products whose AUVs were above the world median at the beginning of the period and fell under this value at the end of the period (dry pasta, wine< 2 lt., non-virgin olive oil and mixed olive oil, and blue cheese). The tendency of Italian exports to reach world markets at low prices for those products that compete on low sophisticated market segments is indicating that Italy is somehow catching up the kind of competition that characterize more the market for these products.

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Looking at the variations of the index, the first evidence is that there is a majority of positive signs (23 products) while for 7 products the level of sophistication was reduced over the period. Among the latter there are: processed rice, grapes and tomatoes, processed fruits, non-virgin olive oil and wine in bottles with less than 2 liters. Due to this reductions, these products fall in the lower part of the distribution were the role of lower income countries is increasing and, thus, price competition is more intense and remuneration of inputs tends to be lower. On the other side, the products that met the major increase of the Prody index climbed many positions on the sophistication ranking and are ready to engage competition on quality attributes that better rewards inputs.

6. EXPORT ELASTICITIES AND CHANGES IN THE PRODY INDEX

The very different values of the elasticity of demand for Italian exports of MiI agri-food products are due to different factors, such as the degree of substitutability among different goods in the food consumption basket, the quality of our products, the market strategies of our major competitors, the market power of our exporting companies. These features are also determinants of the Prody index. Indeed, both elasticities and sophistication deal somehow to the nature and intensity of competition: the first refers to the country's exports, while the second refers to overall world exports. It is then interesting to directly compare the two measures in order to see to what extent and in which cases they match well. This is what we have done comparing the values of the long-run elasticities with the rate of change of the Prody index between 1996-1997 and the 2010-2011 (Figures 5-7).

At first sight, there is no relationship between these two variables. In other words, the elasticity of demand for exports is not related in a systematic way with the rate of change if the Prody index (the coefficient in a cross-section regression is not statistically significant on all three cases considered). However, if we divide each figure into four quadrants, depending on whether the Prody index has grown or decreased over the sample period and on whether each elasticity is greater or smaller than unity in the case of the elasticity of imports to world demand, and to zero in the case of elasticity to AUVs, we obtain a more nuanced picture.

As we have already mentioned earlier, an increase of the Prody index indicates a raise in the level of sophistication of the product in the world markets, and a stronger competition from countries with a level of development similar to ours. Clearly, a reduction indicates the opposite trend, in particular an surge in competition from countries with a lower level of development than Italy.

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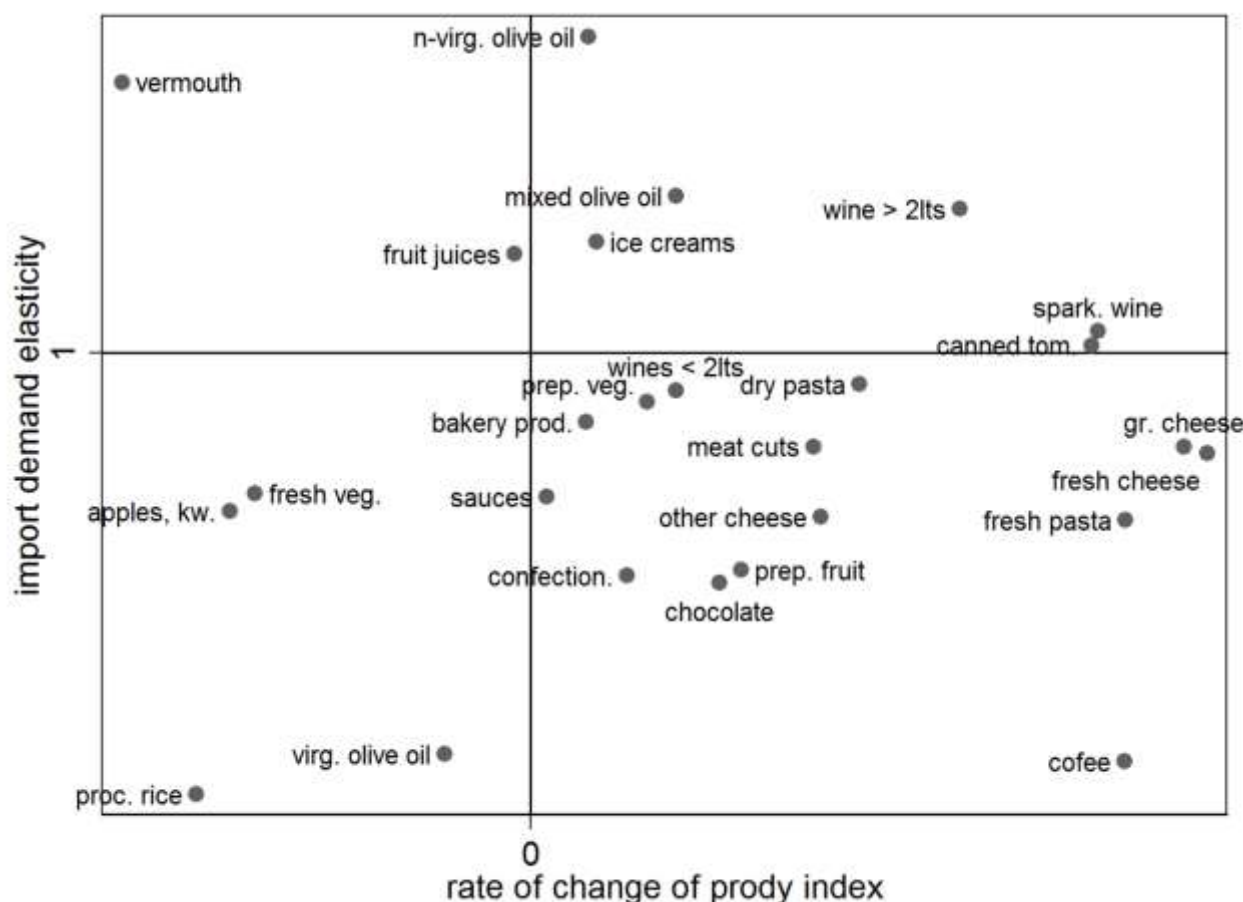Figure 5: Elasticity of Italian export to world demand and changes of the Prody index.

Figure 5 shows that most of the products that have registered an increase of their Prody index show a long-run elasticity of exports with respect to world demand that is smaller than one. For these products (e.g., processed coffee, fresh and grated cheese), despite the increase of the degree of sophistication, Italy's exports are not highly sensitive to the evolution of global import demand. This trend is consistent with a gradual shift in the supply towards the higher quality products, which are less sensitve to changes in global demand. On on side, this implies that they are less capable to benefit from anincrease in world demand, on the other, they are better shielded with respect to the negative consequeces of contractions.

For other products (i.e., non-virgin and mixed olive oil, ice creams, large and sparkling wines, and canned tomatoes) the increase in the degree of sophistication is associated instead with a high elasticity with respect to the demand for imports. In this cases, Italian exporters are able to exploit the opportunities that come from foreign markets, although this clearly imples that they are more severly affected during downturns. Among these products, it is noticeable the presence of wines > 2 lts, mixed olive oil and ice creams.

For the majority of our MiI agri-food exports, the elasticity of demand wih respect to changes in the AUVs of exports is negative (Figures 2 and 6), showing that Italian exporter have narrow margins to increase their prices, despite the fact that it is largely recognized that the quality of our exports is higher than that of most of our competitors'.

Figure 6: Elasticity of Italian exports to export AUVs and changes of the Prody index.

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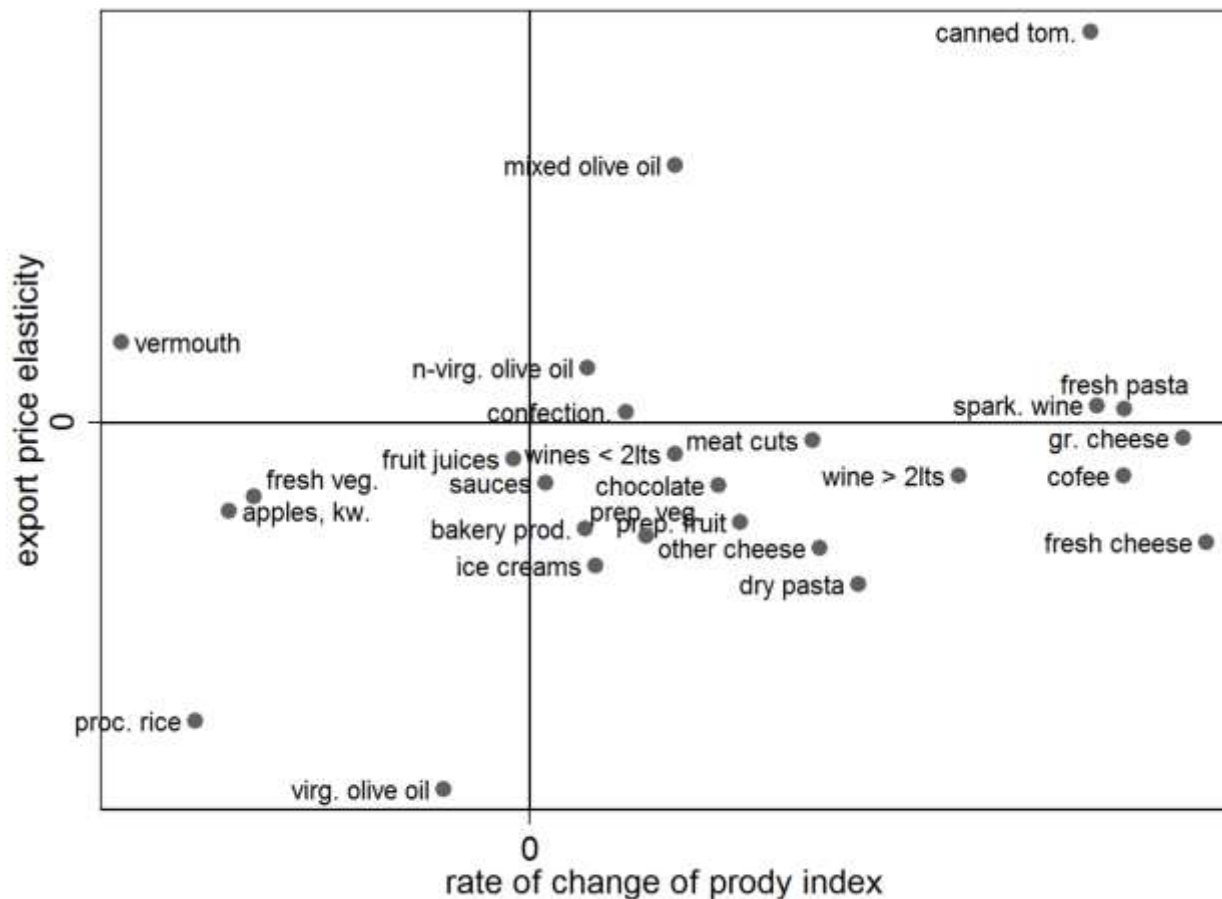
The fact that most of the products that show a rise in their Prody index also have an elasticity of exports with respect to the AUVs of imports from our competitirs that is larger than zero (Figure 7) confirms that, even for these goods, price competition is relevant in the long term. Finally, some products show very perculiar market trends. Canned tomatoes, for example, have registered a strong increase of the Prody index and at the same time show a high long-run elasticity with respect to export AUVs, a trend that is consistent with a progressive switch towards higher quality and, at the same time, a good export performance. On the contrary, in the case of processd rice, the reduction of the Prody index associated with a low elasticity with respect to both the foreign demand and AUVs suggests that the overall performance is likely to depend on a change in the qualitative characteristics of the Italian product.

Figure 7: Elasticity of Italian exports to AUVs of imports of our trade partners and changes of the Prody index.

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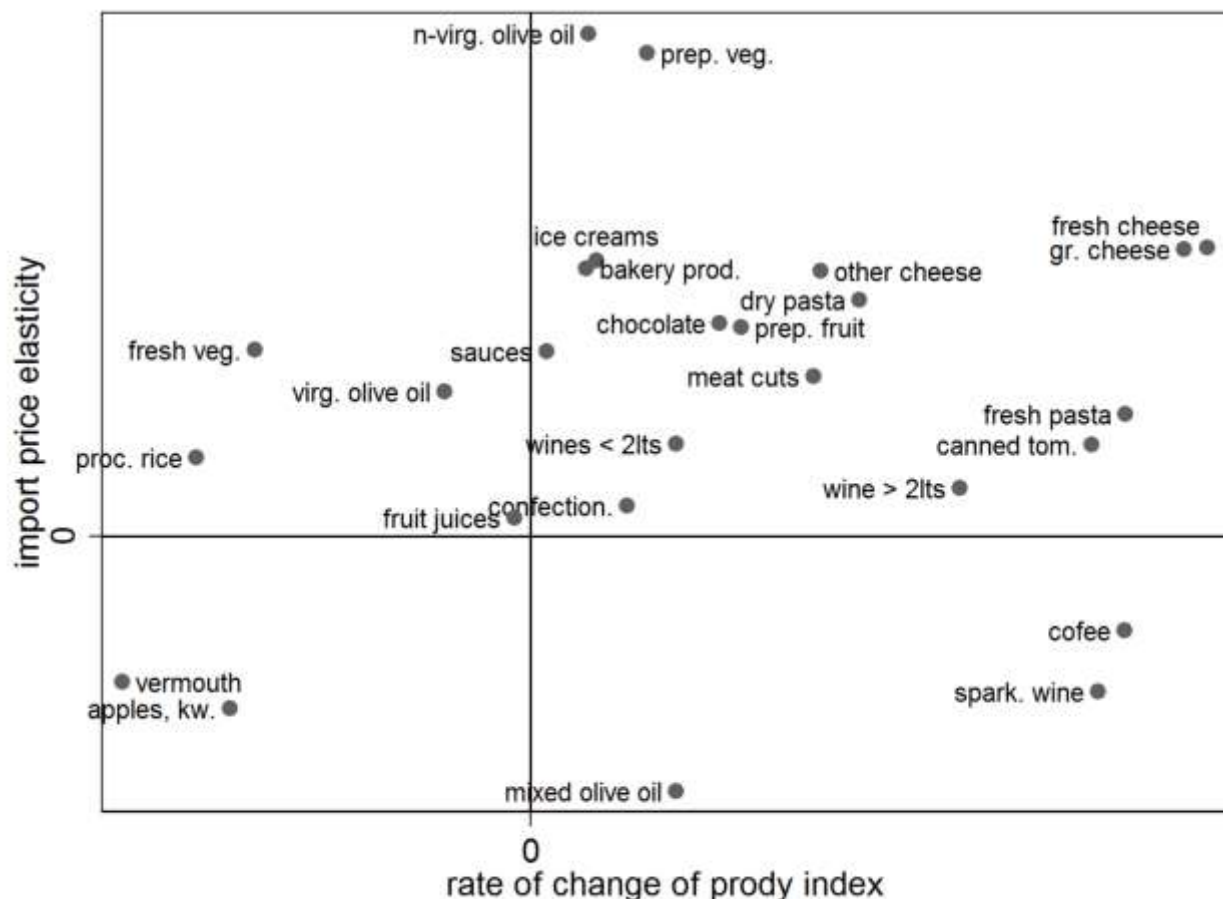
1. Conclusions

In this paper we have presented an empirical analysis of the export performance of Italian agri-food products, focusing especially on those goods that are considered as typical of our country (i.e., typically Made in Italy; MiI).

Our results show that the pattern of MIi exports has evolved towards a specialization in higher quality and more sophisticated products, that better represent the typical features of the Italian territory. World demand for this class of products seems to be growing at a constant pace or, at worse, to remain constant, allowing our country to be a leading global competitor in world supply.

Using a two-steps methodology, based first on the estimation of the long-run elasticities of the MiI exports to the world demand and second prices on their comparison with to the variation of the Prody indices, we have identified different clusters of products. For most MiI agri-food exports, the Prody index increased through time, while estimated export elasticities with respect to world imports are in general less than 1. This means that Italian exporters are not much influenced by the world demand for imports, mainly because our of exports are concentrated in high quality products, whose demand is relatively stable compared to the fluctuations due to short-term crises and to long-term changes in the demand.

Our analysis also shows that the strategy of Italian exporters varies according to the type of product and to the degree of market completion. In some cases, Italian exporters contrast increasing world competition by raising the quality of their products or their sophistication content; in other cases, price competition is chosen , by keeping AUVs at lower levels than those of our competitors. But in nearly all cases, these strategies are successful in allowing Italy to defend and sometimes even to increase its world market shares, in spite of a growing world competition.

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Italian exports seem therefore to well adapt to the market fluctuations, reaching different markets with a widely differentiated level of product quality, and overall being able to highlight the level of sophistication of Mi agri-food products on the world markets. However, this positive picture is shadowed by a few weaknesses. For some products, quality is still too low to provide a strong competitive advantage; for others, in spite of the high quality of our exports, Italy is unable to defend its world market shares. This points to other structural deficiencies of the Italian agri-food system, such as the small size of farms and of processing plants, the low level of delocalisation of Italian firms, and also to the scant levels of public and private investments in research and development, which are key to increasing the level of sophistication of the MiI agri-food exports.

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