"Made in Italy" Firms Competitiveness: A Multilevel Longitudinal Model on Export Performance

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Abstract

The competitiveness of the Italian industrial system during the last decade has shown a strong slowdown. To compete in international markets, Italian firms reduced their costs instead of fostering on innovation and investments, being largely influenced by small size. Only the so-called "Made in Italy" sectors succeeded in international markets. To analyze this phenomenon, we investigate, at firm and sector level, factors affecting export competitiveness in "Made in Italy" sectors using a multilevel longitudinal model in the period 1999-2005. We find that "Made in Italy" role in international markets strongly depends on firms' geographical location and sector of activity and on their innovative capacity and productivity.

Keywords: competitiveness, "Made in Italy", multilevel models

1 Introduction

During the last decade, Italy has experienced a significant slowdown in its economic growth rate. Although other European countries have experienced similar problems in their economies, macro-economic indicators show that the Italian slowdown has been more marked (OECD, 2005). Several reasons lie behind the Italian poor performance: a sharp decline both in physical and human capital investments and in labor productivity. This phenomenon is well known and the Italian economy has been deeply hurt by it. However, in the same period at least part of the economic system has been very successful in international markets. These sectors, called "Made in Italy" sectors, have experienced similar difficulties but they have been capable to capture some opportunities that yielded them to be extremely competitive in international markets. "Made in Italy" sectors are the 3F of the Italian economy (Food, Fashion and Furniture) and are usually considered the most dynamic and creative sectors in Italy (ICE, 2005; Brandolini and Cipollone, 2003; Rabellotti et al., 2009). In a sort of "polarization" of the economy, "Made in Italy" sectors have become worldwide famous and successful while the whole Italian economy was suffering from lost competitiveness. There can be several reasons behind this phenomenon; one of these relates the degree of internationalization of firms and firms heterogeneity competing in international markets (Meyer and Ottaviano, 2008; Castellani and Zanfei, 2007) and their labor productivity and size (Zeli and Mariani, 2009). Indeed, literature emphasizes that firms involved in international activities are "different" from purely domestic firms in several respect (labor productivity, wages, skill intensity, see for all Mayer and Ottaviano, 2007). The underlying idea is that there are relatively few firms "fit" to cope with the more competitive international markets and these firms are more productive, pay higher wages, employ more skilled workers, invest more in R&D (Giovannetti et al. 2009). This paper investigates the factors affecting the export competitiveness of "Made in Italy" sectors in the period 1999-2005 at a firm level, distinguishing between firm-specific factors like size and labor productivity from context-specific factors like the geographical location and the presence of an industrial district in the region. We use a longitudinal multilevel approach to simultaneously model individual and context factors that affect the firms export competitiveness in presence of hierarchical data. The paper is structured as follows: Section 2 briefly describes the "Made in Italy" characteristics, Section 3 introduces the model, Section 4 introduces the dataset, Section 5 discusses the results and Section 6 concludes.

2 "Made in Italy": what is that?

Italy presents a specific technological specialization that has been the object of numerous economic analyses that have tried to explain over the years the diversity of the Italian economic model characterized by elements generally defined as a sign of backwardness, prevalence of small businesses (SMEs) and development and specialization in traditional sectors, which have been transformed into successful factors (the economic literature has often referred to the Italian case as bumblebee Italy; see Becattini, 2007). The traditional sectors also known as "Made in Italy" sectors include: food and wines, fashion furniture, marble, stone and ceramic tiles, metal products, machinery and domestic appliances, motorcycles, bicycles and yachts. They are sectors where the competition is strongest and where the Italian system has been successful over the years. Also, a relevant share of the production of "Made in Italy" is manufactured in industrial districts (IDs) (Conti and Menghinello, 1996; Oropallo, 2007). The industrial district is a structure of firms that involves and integrates economic and social environment into an economic one, creating a network in which firms produce and entrepreneurs and their families work and live. In determining the competitiveness and success of "Made in Italy" specific elements play a role: immaterial factors like tacit knowledge and learning by doing, spillovers from the economic and social context, the capacity in creating and managing the demand for high-quality products. This is one of the reasons why, in order to protect "Made in Italy" specific innovation and quality, a wider use of trademarks and designs rather than patents are used. The performance of these firms is indeed more difficult to be measured and grasped because it is often related to tacit knowledge and skills instead of to new products. The aim of this paper is to analyze the export performance of "Made in Italy" firms including in the model the "spillover effect" from the environment in which they are working (both at a regional and sector level).

3 The Model

The multilevel analysis combines information from more than one level of observation in studying the determinants of various forms of units' behavior. Concerning firms, their behavior is not only influenced by individual goals and characteristics but it is also shaped by the social and economic environment. The multilevel approach, by combining elements from both levels allows greater concordance between the theoretical views and the models employed for studying firms' behavior. Standard regression models (such as GLM), indeed, are not adequate when complex structures of data exist as they do not take into account a crucial feature of the problem, namely the data (hidden) hierarchical structure (Hox and Maas, 2005). To investigate the effect of some characteristics of "Made in Italy" firms on their export performance and competitiveness, we run regression analyses with a longitudinal multilevel approach due to the hierarchical structure of data set. In particular, in our dataset the measurements are repeated on the units (firms) over time, so a basic three hierarchical structure can be arranged with measurement occasions as first level, firms as second level and regions (NUTS2 Eurostat classification) as third level. In this case, we also take into account the average pattern of changes over time as well as the variation of this pattern across units. The hierarchical model is a longitudinal three-level model with random intercept and random slope (Yang and Goldstein, 1996; Skrondal and Rabe-Hesketh, 2004) to allow more general results. Let $X_{t,i,j,h}$ individual variables, where *h* denotes the number of covariates of *i*-th firm in the *j*-th region, for the *t*-th occasion; and let $Z_{t,j,k}$ context variables, where *k* denotes the number of covariates of *j*-th region for the *t*-th occasion. The model is expressed as follows:

$$Y_{t,i,j} = \alpha + \sum_{h=1}^{H} \beta_h X_{t,i,j,h} + \sum_{k=1}^{K} \gamma_k Z_{t,j,k} + \mu_{i,j} + \upsilon_j + \varepsilon_{t,i,j}$$

where

$Y_{t,i,j}$ is the propensity to export with $t=1\ldots T$, $i=1\ldots n$ and $j=1\ldots J$. $\mu_{i,j} \sim N(0,\sigma_\mu^2)$ and $\upsilon_j \sim N(0,\sigma_\upsilon^2)$ are respectively the second and third level casual effects of the model.

4 The Data

To carry out performance and competitiveness analyses, The Italian National Statistical Institute (INSI) proposed a data base (1999-2005), for a population of 1,381,996 limited liability firms in industrial and service sectors. The information record for each firm is obtained combining data coming from the Balance sheet with data of Business Register (ASIA) and Export surveys data. Two additional sources provide information on legal structure and industry affiliation, year of the start of activity (age of firms), economic classification (ATECO, "ATTività ECOnomica"), localization, employment, events of reorganization like fusions, divisions, ceasing of activity, propensity to export (as a share of sales), presence of industrial district in the region and innovative capacity. In this paper, we select information on "Made in Italy" sectors (the 3F only) counting for 10.3% of the whole sample and 47.7% of the manufacturing sectors. For this sub-sample, we analyze the factors that may affect firms export performance: labor productivity (added value per employee) as a proxy of competition on the market, ROI, ROE, ROA for the stake-holders value, innovative capacity of the firm, presence of an industrial district in the region and size. A preliminary descriptive analysis (Table 1 versus Table 2) comparing manufacturing and "Made in Italy" sectors reveals that 98% (versus 77% of manufacturing) of firms in our sample has introduced an innovation (either process or product innovation) during the period and that "Made in Italy" sectors export on average 21% of their sales (versus 16% in the whole sample). The competitiveness proxy (added value/cost of labor) is very similar between the two groups and shows high heterogeneity in the data. Interestingly, "Made in Italy" firms tend to cluster more than the manufacturing firms (49% versus 43% of firms work in an industrial district area) and show slightly higher levels of productivity (added value is 10.92 versus 10.45). Finance indicators (roi, roa, roe) are very similar.

Variable	Description	Mean	Std.Dev.	Min	Max
f_exp	Export/Sales	0.16	0.25	0	1
lvaladd	Return on Investments	10.45	0.69	-0.45	12.83
roi	Return on Net Capital	0.17	0.30	-1	1
roe	Return on Earnings	0.07	0.36	-1	1
roa	Value Added (log)	0.05	0.11	-1	1
compet	Value Added/cost of labor	140.78	60.66	-19.20	567.23
dummy_dist	Belong to an ID	0.43	0.49	0	1
age	Age of Firm	17.55	12.21	0	140
employees	Number of Employees	34.37	167.44	0.25	18108
inno	Innovative Capacity	0.78	0.14	0	1

Note: 383677 observations.

Table 1. Descriptive Statistics on the manufacturing sectors

Variable	Description	Mean	Std.Dev.	Min	Max
f_exp	Export/Sales	0.21	0.28	0	1
lvaladd	Return on Investments	10.92	0.70	-0.45	12.83
roi	Return on Net Capital	0.16	0.30	-1	1
roe	Return on Earnings	0.06	0.36	-1	1
roa	Value Added (log)	0.05	0.11	-1	1
compet	Value Added/cost of labor	140.69	61.71	-19.14	567.23
dummy_dist	Belong to an ID	0.49	0.50	0	1
age	Age of Firm	17.95	12.55	0	140
employees	Number of Employees	34.31	131.35	1	8506
inno	Innovative Capacity	0.98	0.12	0	1

Note: 183421 observations

Table 2. Descriptive Statistics on the "Made in Italy" sectors

5 The Results

To run a multilevel model a two step procedure is required: 1) a null model is estimated to test second and third level variance significance to show the existence of a hierarchical structure in the data and 2) a general model is estimated including individual and context variables. The results of the likelihood ratio test on second and third level significance (region and sector) show that the multilevel approach is appropriate (LR chi2 = 224.23, p-value<0.001). Test results show that a hierarchical structure in the data exists, confirming the use of a multilevel approach to describe and forecast Italian firms propensity to export. Then, we run a null and a general model, to select the best specification for our data. The best model specification has been detected inserting in the null model, firstly, the individual and, secondly, the context variables. Several models have been estimated to test the stability of the estimates both at individual and context level. Table 3 reports the selected model showing that it fits well the data.

Dep. Var: f_exp	Coef.	Std.Err.	z	P>|z|
added value	0.0137	0.0009	15.86	<0.01
roi	-0.0112	0.0014	-7.96	<0.01
roe	0.0002	0.0011	0.21	0.83
roa	-0.0652	0.0056	-11.71	<0.01
districts	0.0033	0.0010	3.30	<0.01
competitiveness	0.0002	0.0000	19.95	<0.01
age	0.0005	0.0000	14.98	<0.01
employees	0.0000	0.0000	17.62	<0.01
Innovation	0.0906	0.0045	20.22	<0.01
Region_2	-0.0209	0.0180	-1.16	0.25
Region_3	0.0022	0.0018	1.22	0.22
Region_4	-0.0020	0.0034	-0.61	0.55
Region_5	0.0139	0.0020	6.95	0.00
Region_6	0.0080	0.0029	2.77	0.01
Region_7	-0.0029	0.0029	-0.99	0.32
Region_8	-0.0053	0.0020	-2.67	<0.01
Region_9	-0.0074	0.0021	-3.59	<0.01
Region_10	-0.0198	0.0033	-6.03	<0.01
Region_11	-0.0010	0.0030	-0.33	0.75
Region_12	-0.0106	0.0019	-5.68	<0.01
Region_13	-0.0140	0.0034	-4.13	<0.01
Region_14	-0.0351	0.0070	-5.04	<0.01
Region_15	-0.0159	0.0022	-7.21	<0.01
Region_16	-0.0134	0.0027	-4.92	<0.01
Region_17	-0.0474	0.0082	-5.78	<0.01
Region_18	-0.0251	0.0037	-6.81	<0.01
Region_19	-0.0200	0.0025	-8.15	<0.01
Region_20	-0.0222	0.0030	-7.28	<0.01
Sector_17	0.0531	0.0035	15.21	<0.01
Sector_18	0.1048	0.0032	32.34	<0.01
Sector_19	0.1542	0.0036	43.22	<0.01
Sector_26	0.0368	0.0052	7.13	<0.01
Sector_29	0.0181	0.0065	2.78	<0.01
Sector_36	0.0446	0.0060	7.48	<0.01
Constant	-0.1825	0.0097	-18.78	<0.01

Note: In Appendix 1 we report the list of regions and sectors

Table 3. Model Estimates (level 1: time, level 2: sector, level 3:region.)

The results show that all individual variables but Roe (returns on earnings) are positive and statistically significant. For example, one unit increase in the added value of a firm increases its average propensity to export by 1.3% while the role of the

competitiveness proxy, age and size are less evident (although still significant and positive). The cost of labor has a positive and high coefficient, stressing that better skilled and better remunerated employees help the firm improving its role in international markets. As expected, export competitiveness strongly relies on the skills of labor and suffers by cuts in the remuneration of the labor factor. Firms investing in innovation and productivity have higher probability of succeeding in international markets, confirming Meyer and Ottaviano (2007). All individual factors positively affect the export competitiveness of "Made in Italy" firms and represent important elements in driving it. On the context variables side, geographical location and sector turn out to be important factors too. In particular, while working in some regions does not give a comparative advantage (see for example Val d'Aosta and Liguria) being and working in some other regions strongly affect the firms' export performance. It is worth noticing that Veneto, Lombardia and Friuli Venezia Giulia represent the most stimulating places where establish and run a firm: a key factor that positively affects the "Made in Italy" firms performance. This result is extremely interesting because, as often discussed in the literature, it confirms that these regions (North-East regions) represent a fertile context for firms performance in the period 1999-2005. Moreover, disaggregating the role of sector, although all "Made in Italy" sectors perform quite well in the period considered, being in the Fashion and Leather sectors represents an extra-positive factor for exporting firms. This is in line with several studies on "Made in Italy" boom that show the surprising performance of these sectors in international markets.

6 Conclusive Remarks

Italy's competitiveness during the last decade has shown a strong slowdown: to compete in international markets Italian firms reduced their costs instead of fostering on innovation and investments. Although the whole economy has declined, a bunch of sectors, the so called "Made in Italy" sectors, has improved its role in international markets. In a sort of "polarization" of the economy, "Made in Italy" sectors have become worldwide famous and successful while the whole Italian economy was suffering from lost competitiveness. This paper investigates the factors affecting the export competitiveness of "Made in Italy" sectors in the period 1999-2005 at a firm level, using a longitudinal multilevel approach to simultaneously model individual and context factors that affect the firms export competitiveness in presence of hierarchical data. We show that there are a few factors driving the growth and success of these sectors over the period and they are strictly related to firms' innovative capacity and to firms' strategies on labor (both in terms of productivity and costs). Also, "Made in Italy" firms benefit from social capital that spill over the industrial districts improving their role in international markets. In particular, some sectors and regions turn out to be the most intriguing elements of this counter-cyclical phenomenon: firms in the North-East and in specific sectors, like fashion and leather, take advantage of a mix of experiences and skills that strongly help firms' export competitiveness.

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Appendix: Regions and Sectors

Istat Code	Region
1	Piemonte
2	Valle D'Aosta
3	Lombardia
4	Trentino Alto Adige
5	Veneto
6	Friuli Venezia Giulia
7	Liguria
8	Emilia-Romagna
9	Toscana
10	Umbria
11	Marche
12	Lazio
13	Abruzzi
14	Molise
15	Campania
16	Puglia
17	Basilicata
18	Calabria
19	Sicilia
20	Sardegna

ATECO Code	Sector
17	Food
18	Apparel
19	Fashion
26	Leather
29	Mechanics
36	Furniture