The good of euro
Technological changes in low-tech and high-tech manufacturing firms in Italy

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Abstract
Over the past ten years fundamental changes such as globalization and technological upheaval took place both inside Europe and outside Europe in countries such as India and China. In most countries manufacturing firms have responded to such challenges by engaging in R&D and innovation. This paper aims at gaining an understanding of the innovative experience of Italian manufacturing firms, by exploring the relationship between their R&D, physical capital investment and innovation before and after euro. Evidence shows that product innovation is seen as a means for Italian manufacturing firms to face tougher competition. In particular, while high-tech firms relied more on product innovation, firms in traditional sectors started to use product innovation to face global competition. On process innovation side, while high-tech firms keep on adopting new technologies, low-tech firms reduced drastically their innovation in production processes. When exploring the link between firm characteristics and firm value added for the sample of product-innovating firms (those managed the increased competition by engaging in product innovation), we find that, compared to non product-innovating firms, those firms achieve higher value added when investing more on human capital resources and are family-controlled.

Keywords: Euro, product innovation, process innovation, firm value added, Italian manufacturing

JEL classification: L25, L60, 030, C20

1. Introduction

The euro has caused a big break with the past for most manufacturing firms in Europe. Small firms as well as large firms have changed their way of working and organising themselves to benefit from the single market. How did euro affect the Italian manufacturing firms' decision of doing innovation? And how did the four attributes of Italian manufacturing firms, namely specialisation, size, family management, and localization, impact on their innovation decision? This paper seeks to respond to such research questions.

Italy is a country of a great number of labour intensive firms, and highly specialised in consumer industries such as fashion, food and drinks. Recent studies such as Dosi et al. (2011) and Bugamelli et al. (2010) have claimed that, in response to the euro and the new requirements of the global marketplace, Italian firms have been more 'actively' and 'positively' engaged with their inputs. After euro some Italian firms seemed to have created new products, incorporated new technologies and upgraded their product lines to accommodate the new consumption patterns and preferences of people.

In this paper I hope to explore whether the euro has been a great shock for Italian manufacturing firms, whether the euro has challenged the sectors competing mostly in prices than those competing in products, and whether the impact of exporting firms on innovation has been higher after euro than before euro. Thus, I will consider

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the role of sectors, exporting status in innovative activities of manufacturing firms before, and after the adoption of euro.

The data set used in this paper is from the *UniCredit* Surveys containing data for a sample of manufacturing firms over the period 1995-2006.However, as some firm information in the questionnaire survey such as firm sector, firm engagement in R&D, firm innovation were identified and explored through questions referred to a three-year interval, the empirical model used in this paper -consisting of two main equation, i.e.innovation and value added equation, is estimated using the data on a three year period with gaps, that is 1997-2000-2003-2006.

In what follows, I summarise the theoretical underpinnings of my empirical analysis. In section 3 I present the econometric model used. In section 4 I discuss my empirical results and then I make some conclusions.

2. Theoretical background

In Italy innovation is mostly incremental, marked by continuous but small scale improvements to existing product lines and production processes. More precisely, most innovation occurring in Italian manufacturing firms creates new or significantly improved products, which may entail significant process innovations as well. Moreover, as most Italian scholars such as Antonelli and Amidei (2011) have argued, innovation in Italy does not originate from formal R&D, but from learning by doing, by using, and by interacting with suppliers, competitors, customers, and universities.

Before discussing my empirical model, I will explore the fundamental factors such as investments on R&D, education, and physical capital that influence Italian firms probability of innovating in product or in process, and firm valued added.

The most important kind of investment behind innovation is R&D expenditure. Most studies have argued that R&D investment is particularly important for innovation and firm performance as it helps firms to build and increase their absorptive capacity, and develop more efficient productive processes. Geroski et al. (1993), among others, have argued that the R&D is important for firm's performance, highlighting the need to make a distinction between "the process of innovating" -term used for describing firm's ability and competence to allocate, and use its resources efficiently, and "the product of the innovation process" -term used for describing a new product or a new process. In particular, they say that:

"This distinction is important because it corresponds to two quite different views about why innovation may be associated with superior performance: that it is the product of the innovative process which matters because new innovations favourably affect a firm's market position, or that it is the process of innovation which matters because it transforms a firm's internal capabilities" (Geroski et al., 1993: 199)

Another important factor that produces innovation is investment in machinery, and equipments. Several studies such as Archibugi (1991) and Vivarelli (2004) highlight the importance of capital investments for Italian manufacturing firms. Archibugi (1991), for example, has argued that, because of their small size, Italian firms'

innovative activities do not rely upon formal R&D activities but on design activity in the capital goods sector, that is engineering and other 'lower' forms of knowledge. Indeed, the great majority of Italian firms are of small size and work in labour intensive activities where entrepreneurs, technicians and foremen play a crucial role. The study of Vivarelli (2004) has pointed to the ways in which formal R&D activities and investments in physical capital goods affect innovation in products and processes among Italian manufacturing firms. He has found that product innovation relies more on formal R&D than on investment in new machinery and equipment, whereas process innovation is much more related to investment in new machinery and equipment. A more recent study of the importance of capital investment for process innovators (Huang et al. 2010) has suggested that firms that find clients and universities as an important source for innovation are more likely to be R&D performers, while firms that source information from suppliers and competitors have a higher probability of innovating through non-R&D activities. Furthermore, they have found that firms with weak innovative abilities tend to rely disproportionately on non-R&D activities and are evident by their small size, lack of exports, as well as employees with limited higher education.

A third important factor is the qualified labour force in manufacturing firms. Indeed, one thing that is very clear from 'innovation studies' is that efficient use of R&D investment and technology requires qualified human capital. Cohen and Levinthal (1986), for example, have argued that firms must have their own laboratories and staffs of scientists and engineers in order to innovate and/or to absorb R&D investments made by others. Other empirical studies, such as Cohen and Klepper (1992) and Klepper (1997) have observed that expertise, together with the size of the firm, determines the composition of R&D and direction of innovative activities. Indeed, firms that initially possess a well-developed "knowledge system" are able to perceive further investment more productive, and hence make possible virtuous cycles. More recent studies have found that much of the productivity differences among firms is due to the poor management skills. For example, Van Reenen (2011) have found that the UK manufacturing firms perform less well overall that other countries because of the lack of skills.

There is a large number of studies assessing how the status of exporter affects the likelihood of firm innovating, and its performance. This is so because being exporters provide new opportunities for innovation: it helps firms to acquire knowledge and learning, and encourages firms to commit themselves in R&D, and innovation. Under this view, some studies such as Harris and Moffat (2011) and Carboni (2010) have found how the acquisition of external knowledge, through collaboration with foreign firms for example, increases firm likelihood of innovating as it complements with internal R&D. According to other studies such as Bratti and Felice (2011), exporting firms are more likely to innovate, because they are more likely to have some degree of technological and market competencies.

There is a huge amount of evidence (Castellacci, 2007; Malerba and Montobbio, 2003; Nelson and Winter, 1982; Winter, 1984 and 2006) suggesting that firm innovation, and productivity is related to firm industry structure's characteristics, that is those features known in innovation-related studies under the term of 'cumulativeness conditions', 'technological opportunities', and 'appropriability

conditions'[2].

The idea of this study is to determine how the euro has changed the Italian manufacturing firms' innovation strategies, product and process innovation, and then to assess how the introduction of euro, and innovation explain firm value added. In other words, this paper seeks to investigate whether the market openness consequent to the adoption of euro might have induced manufacturing firms to change their innovative strategies.

2. The model

As most empirical studies (Hall et al., 2008; Parisi et al., 2006; Hall and Mairesse, 2006) within innovation literature have suggested, I exploit the relationship between R&D, innovation and firm performance estimating the following two equations:

$Y=\alpha_1 INN+\alpha_2 \mathbf{x}+u_1$ (1)
$INN=\beta_1 R\&D+\beta_2 \mathbf{x}+u_2$ (2)

where Y is firm value added, INN is firm product and process innovation, R&D is firm expenditure on research and development and **x** is a vector of firm specific characteristics .
Equation (2) is estimated using bivariate probit model, where the dependent variables are firm's propensity to report product innovation, and process innovation (product innovation is defined as taking value 1 for those firms reporting product innovation and 0 for those who did not, while process innovation is defined as taking value 1 for those reporting process innovation and 0 for those who did not)[3]. The variables capturing firm specific characteristics are: firm's size, proxied by firm employment; sector of activity defined as a dummy variable - based on the Pavitt taxonomy, taking value 1 if the firm operates in high-tech and specialised sectors, and 0 if the firm operates in traditional and scale sectors; and firm exporting capacity defined as a dummy variable that is equal to 1 for exporting firms and 0 otherwise. I start with a baseline specification, and then add localization, family management, and firm R&D employment measures. I did so because some Italian scholars such as Bugamelli et al. (2011) have argued that specialization, size, family management, localization, and R&D employees matter for innovation and economic performance. In this study, family management variable is defined as the number of firm family

[2] The term of 'cumulativeness conditions' refer to the extent to which innovation activities accumulate over time and are path dependent. The 'technological opportunities' refer to the probability that firm's innovative efforts –and the investments made in different types of knowledge assets- eventually lead to significant technological advancements. The 'appropriability conditions' refer to the way in which the economic benefits of innovation can be appropriated by the innovator.

[3] Within innovation literature it is well-known that when using the categorical innovation data the responding firms might have answered the question "Which sort of innovation have you done in the last two years?" subjectively in the way in which they felt innovation positively affected their way of working, and organising themselves, and thus how they perceived innovation. So as these responding firms might have said to innovate in product via either a new product or new brand or a new design. The UniCredit Survey defines R&D as those activities oriented toward the development of new knowledge and of ways to apply such knowledge to new products. The Survey gives the example of those R&D activities that lead to the development of technologically new or improved products and process.

managers. Localization variable is defined as a dummy variable taking value 1 for firms based in the South of Italy, and 0 otherwise; such variable accounts for the dualistic nature of Italian economy. The variable capturing R&D employment is defined as the number of R&D employees. The innovation equation (2) is estimated for the whole sample, for pre-euro period (1995-2000), and after the euro (2001-2006), while the value added function (3) is estimated for post-euro period only.

3. Results

In what follows, I examine the contribution of R&D, capital investment and labor to firm probability of reporting product and process innovation. I estimate the relationship before and after euro, then I examine the same relationship for the whole period using the dummy variable approach. When using the dummy variable approach, I let the euro dummy interact with high-tech sectors because I expect to find for high-tech sectors, the creation of new product, particularly through R&D, is the main route to competitive advantage, whereas for low-tech sectors, maintaining a role in production is the main route. I then add localization, family management, and R&D employment measures and re-estimate my regression for post-euro period.

Using the *UniCredit Survey* relating to a three-year time period, I estimate the bivariate probit model. The results (the marginal effects of βj, and their *p*-values) are shown in table 1. I start with a baseline specification (equation 2) estimated for pre-euro period (column 1), for post-euro period (column 2), and then estimating for the full period adding export dummy (column 3) and interaction variable HT*Euro dummy (column 4).

Before euro, the bivariate probit regression shows that the marginal coefficient of the logarithm of R&D expenditure is not statistically significant for both firm propensity of doing product and process innovation. The marginal effect of physical capital investment on firm propensity of doing product innovation is positive and significant, suggesting that one unit increase in the logarithm of capital investments leads to an increase of firm probability of reporting product innovation by about 2 percent. It can be seen that the probability of reporting process innovation for one unit increase in the physical capital investment is about 5 percent. Firm size has a positive but not statistically significant effect on firm probability of reporting product innovation and process innovation. Looking at the marginal coefficient on high-tech dummy, we notice that firms with high-technology are by 5 percent more likely to report product innovation than firms operating in low-tech sectors, while it is not statistically significant for process innovation. The marginal effect of firm exporting status suggests that exporting firms are by 9 percent more likely to report product innovation than non-exporting firms. It is not statistically significant for process innovation.

After euro, the probit estimates of the logarithm of R&D expenditure indicates that the probability of reporting product innovation rises by 1.4 percent for one percent point increase of R&D investments. For process innovation, this is not statistically significant. The marginal effect of physical capital investment on firm propensity of doing product innovation is not statistically significant, while it is positive and significant for process innovation: one unit increase in the logarithm of capital investment leads to an increase of firm probability of reporting process innovation

by about 3 percent. Firm size has a very significant and positive effect: for one unit increase of employment the probability of reporting product innovation increases by 5.8 percent. For process innovation, this is 6 percent. Looking at the marginal coefficient on export dummy, while it is not statistically significant for product innovation, it is positive and significant for process innovation: exporting firms are by 5 percent more likely to report process innovation than non exporting firms.
Thus, these findings suggest that the industrial sector and firm size influence firm's propensity to develop new products, while being exporters and large are the main factors influencing firm propensity to develop new processes[4]. In other words, the globalization and the technological upheaval induce high-tech and large firms to create new products. On the other hand, they encourage large exporters to do process innovation. A possible explanation for this result is that high-tech firms responded to the increased competition leveraging on their scale and their intrinsic dependence on skills and knowledge (moreover, they are used to deal with technological changes and market uncertainty), while exporting firms responded to the increased competition following a cost reduction strategy.

In column (3), I run the bivariate probit regression for the full period including the euro dummy variable, which takes value 1 for pre-euro period and 0 otherwise.
Compared to those reported in columns (1) and (2), most coefficients do not change much. Large and high-tech firms show greater propensity to embracing product innovation than small and low tech firms, while large and exporter firms are more likely to do process innovation. However, this bivariate probit regression estimated for the whole sample gives us an additional information, that is that the euro scenario increased firm propensity of innovating in products by around 12 percent, while it decreased the propensity of innovating in process by around 17 percent. This suggests that most firms in Italy responded to the increased competition by engaging in product innovation. This results is in line with several studies such as Christensen and Raynor (2003) suggesting that product innovation is essential for firms to thrive in globalised and increasingly aggressive markets.

Looking at the marginal coefficients in column (4), including the interactive term between high-tech sectors and the euro dummy, we notice that the investments in R&D activities have a small and positive effect on firm propensity of innovating in products, while investment in physical capital has a small but significant effect on firm propensity of innovating in process. For each unit increase in the logarithm of R&D expenditure, the propensity of innovating in products increases by 1.1 percent, while one percent increase in investment in physical capital increases the firm propensity of innovating in production process by around 4 percent. The euro dummy coefficient now decreases from 12 to 10 percent, but now estimates the marginal effect of innovating in products after euro for firms operating in low-tech sectors. Thus, after euro, firms in low-tech sectors are more likely to innovate in products by around 10 percent than they were before euro. The slope coefficient of high-tech sectors indicates that high-tech firms before euro are more likely to innovate in products by more than 4 percent than low-tech firms, i.e. traditional and scale intensive sectors. The interactive effect is statistically significant, suggesting

[4] Wald test confirms that there are statistically significant differences in these factors.

that during the euro phase firms with high-technology are about 6 percent more likely to create new products. This suggest that while high tech firms relied more on product innovation to face global competition, firms in traditional sector started to use product innovation to face global competition. Thus, the overall suggestion is that product innovation is essential for low-tech firms to be globally competitive.
The process innovation regression shows that the likelihood of innovating in production process is around minus 18 percent for firms operating in low-tech sectors. The interactive effect suggests that the likelihood of innovating in processes for firms operating in high-tech sectors is around 5 percent. These results implies that, while low-tech firms reduced drastically their innovation process, high-tech firms keep on adopting new technologies.

3.1 Further results [table 2]

The arguments that have been made recently by most Italian scholars such as Bugamelli et al. (2012), Pagano e Schivardi (2003) is that specialization, size, family management, localization, and R&D employment remain a concern for Italian manufacturing firms' innovative performance. Bugamelli et al., among others, have found in these attributes the main culprit for manufacturing firms' low productivity growth in Italy.

Thus, in what follows, I run the bivariate probit regression (1) for post-euro period, adding these variables among explanatory variables.

In relation to product innovation, R&D investment is important for creating new products. As shown in table 2, if Italian manufacturing firm invest one percent more on R&D, they are more likely to develop new products by 3 percentage points. Firms with high technology are about 8 percentage points more likely to create new products than firms with low technology. This is so because firms with high technology are more likely to appropriate the benefits of their R&D activities than firms in low-tech sectors. From our analysis, it also emerges that firms with family managements are more likely by 4 percent to report product innovation than firms that do not have family management. A possible explanation for this result is that firms with family management might know how to employ highly skilled workers as they may have a connection with labor markets. Furthermore, firms with family management might be able to delegate well and trust their workers. Firms that hire high-qualified people for their R&D activities are more likely to report new products. A one percent increase in R&D employment leads to 7 percentage increase in firm likelihood of developing new products. Firms open to global markets are more likely to innovate in product by 6 percentage points than firms closed to global markets.

In relation to process innovation, we see that firms that spend one percent more on equipments and machinery are more likely to make changes in their production process. So as employment is an important driver of firm success of reporting process innovation. Finally, as in product innovation equation, firms with R&D workers are more likely to report process innovation. A one percent increase in R&D employment increases firm likelihood of reporting changes in production by around 7 percentage points, ceteris paribus.

These results suggest how family management is not an obstacle for doing product innovation, while their R&D capabilities, the localization (expected negative sign but highly insignificant), and the industry where operate matters for product innovation. In contrast, family management influence negatively firm likelihood of doing process innovation (highly insignificant though), while specialization in traditional sectors and localization does not matter for process innovation (expected signs but highly insignificant).

4. Estimation results on firm value added

As discussed in section 3, the growing competition from the adoption of euro has increased Italian firms' likelihood of doing product innovation. Hypothesizing that the impact of firm characteristics (firm size, ownership structure, sector, location and exporting status) on firm value added is different across product-innovating firms and non-product innovating firms, in this section I perform regressions of the logarithm of value added on the logarithm of capital, labor, including dummy variables for sector, location, exporting status and family managers for these two sample of firms. The results for these two regressions are reported in column (1) and (2) of table 3, respectively.

Interpreting the regression results jointly, we may note that value added increases by 0.14 percent for one percent increase in physical capital investment for firms engaged in product innovation, whereas it increases by 0.23 percent for firms not engaged in such activities. The Wald test confirms there is difference in the size of these elasticities. A possible interpretation for this result is that firms engaged in product innovation may invest less in machinery and equipment and thus reporting lower value added than firms non product-innovating. Looking at labor input, value added increases by 0.862 for one percent increase in employment if firms engage in product innovation, whereas it increases by 0.649 if firms not engaged in such activity. This may indicate that firms engaged in product innovation invest more in human capital resources and thus report higher value added than non-product innovating firms. Thus, product innovating firms achieve higher value added if they are larger and invest in those skills and competencies from which product innovation can develop, while non product innovating firms achieve higher value added if they acquire new equipments and machinery to keep abreast with the frontiers of technology. The 'export propensity' enter positively in both samples but is highly statistically insignificant. This means that exporting does not affect firm value added among these sample of firms. The sector dummy estimate indicates that high-tech firms developing new products have 11 percent higher value added than firms in 'low-tech' sectors (i.e. my reference category), whereas those that do not develop new products have 18 percent higher value added than low-tech firms. Thus, one may conclude that high-tech and non product-innovating firms have higher value added than high-tech firms product-innovating. But the Wald test does not confirm that suggesting that there is no difference among these two categories of firms. The coefficient of 'south' dummy is negative but highly insignificant for product-innovating, and highly statistically significant for non product-innovating firms. More precisely, value added decreases by 23 percent for non-product innovating firms located in the South, whereas it decreases by 6 percent for product innovating firms based in the South of Italy (although insignificant). This finding is rather interesting as it suggests that being located in the South affects negatively firm value added unless the firm is product innovating. Thus, although being located in the

South affect negatively firm propensity of reporting product innovation, it is not a disadvantage for performing well. The coefficient for 'family managers' is significant for product-innovating firms, while is highly statistically insignificant for non product-innovating firms. That is family-managed firms engaged in product innovation are by 11 percent more likely to increase their value added than those not family-controlled firms, whereas for family-managed firms not innovating in products, value added decreases by 8 percent more than those not family-controlled and non product-innovating firms (insignificant though). This result is quite surprising as it is not in line with a consistent literature (see, among others, Amatori et al., 2011; Bugamelli, Cannari, Lotti and Magri, 2011; Bloom and Van Reenen, 2007) suggesting that family firms are a problem for firm innovation and performance, because they tend to be a higher risk aversion, as a consequence of the stronger correlation between business and family wealth, and to adopt worse managerial practices which are associated with lower productivity and innovation. However, our result is economically plausible if we consider the undeniable economic transformations since euro was introduced. In light of these transformation, this result may suggest that family-managed firms that were able to embrace technological changes achieved higher value added.

Overall these results suggest that product-innovating firms achieve higher value added when invest more on human capital resources, and are family-controlled. Another interesting result is that while the performance of product innovating firms is not dependent on the location, being located in the South of Italy has a negative effect upon firm value added for non-product innovating firms.

5. Conclusions

This study has sought to give an insight into innovation and performance by manufacturing firms in Italy. It has investigated how firms have managed the new 'euro' scenario by redefining their innovation strategy, and it has explored the performance of product-innovating firms compared to non product-innovating firms. Two main results arise from this empirical study. Product innovation has been regarded as essential for both low-tech and high-tech firms to thrive in globalised market, while process innovation is seen as a way forward for high-tech firms only. Secondly, there are some differences in performance among product-innovating firms and non-product innovating firms attributable to family management and size factor. The general picture arising from this study is that Italian firms in both high-tech and low-tech sectors understand the importance of innovation, and shift their investment accordingly; finally, it seems that the performance of product-innovating firms is not hamstring by their family management.

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Table 1. Bivariate probit estimates of firm probability of doing product and process innovation

Dep. Var.: Product innovation (1/0)	**Before euro (1)**	**After euro (2)**	**Full sample (3)**	**Full sample (4)**
Explanatory variables				
R&D investment	0.007 (0.251)	0.014 (0.003)	0.011 (0.002)	0.011 (0.003)
Physical capital investment	0.023 (0.021)	0.001 (0.852)	0.007 (0.215)	0.007 (0.196)
Employment	0.002 (0.894)	0.058 (0.000)	0.040 (0.000)	0.040 (0.000)
Control variables				
Specialised and science-based firms (HT)	0.052 (0.018)	0.102 (0.000)	0.082 (0.001)	0.045 (0.034)
Export propensity	0.092 (0.001)	0.091 (0.000)	0.093 (0.000)	0.093 (0.000)
Euro dummy			0.123 (0.000)	0.099 (0.000)
Euro dummy * HT				0.062 (0.025)
Dep. Var.: Process innovation (1/0)				
Explanatory variables				
R&D investment	0.007 (0.227)	0.003 (0.553)	0.004 (0.229)	0.004 (0.487)
Physical capital investment	0.048 (0.000)	0.029 (0.000)	0.035 (0.000)	0.036 (0.000)
Employment	0.011 (0.492)	0.061 (0.000)	0.046 (0.000)	0.046 (0.000)
Control variables				
Specialised and science-based firms (HT)	-0.005 (0.804)	0.028 (0.136)	0.013 (0.347)	-0.015 (0.508)
Export propensity	-0.016 (0.558)	0.051 (0.010)	0.030 (0.074)	0.029 (0.079)
Euro dummy			-0.168 (0.001)	-0.185 (0.000)
Euro dummy * HT				0.047 (0.095)
N. obs.	2219	3489	5708	5708
Wald test on R&D inv.	0.74 (0.3894)			
Wald test on phy. Cap.	3.30 (0.0693)			
Wald test on emp.	7.08 (0.0078)			
Wald test on export	0.01 (0.9404)			
Wald test on HT	3.19 (0.0743)			
Wald test on R&D inv.	0.38 (0.5363)			
Wald test on phy. Cap.	3.40 (0.0651)			
Wald test on emp.	4.77 (0.0290)			
Wald test on export	3.46 (0.0630)			
Wald test on HT	1.28 (0.2587)			

Table 2. Bivariate probit estimates of firm probability of doing product and process innovation, sample period 2001-2006.

Dep. var.: Product innovation (1/0)	Coeff.	P>|t|
Explanatory variables		
R&D investment	0.031	0.001
Physical capital investment	0.004	0.540
Employment (size)	0.013	0.327
Control variables		
High tech firms (specialization)	0.079	0.000
Southern firms (localization)	-0.021	0.473
Family managers (family management)	0.044	0.067
R&D employment	0.073	0.000
Export propensity	0.061	0.004
Dep. var.: Process innovation (1/0)		
Explanatory variables		
R&D investment	0.008	0.197
Physical capital investment	0.031	0.000
Employment (size)	0.029	0.028
Control variables		
High tech firms (specialization)	0.002	0.928
Southern firms (localization)	0.032	0.268
Family managers (family management)	-0.012	0.603
R&D employment	0.068	0.000
Export propensity	0.026	0.225
N. obs.	3262	
Wald test	349.75	0.000

Table 3. Tobit estimates of firm value added for product innovating firms and non product innovating firms, sample period 2001-2006

Dep. Var.: Firm value added in logs	(1)		(2)	
	Product strategy		No product strategy	
	Coef.	P>|t|	Coef.	P>|t|
Physical Capital investments in logs	0.141	0.000	0.229	0.000
Employment in logs	0.862	0.000	0.649	0.000
Specialised and science-based firms	0.113	0.006	0.184	0.000
South	-0.066	0.391	-0.231	0.000
Export propensity	0.038	0.546	0.031	0.280
Family managers	0.109	0.020	-0.079	0.138
Constant	3.703	0.000	3.593	0.000
N. obs.	504		2143	
Pseudo R^2	0.847		0.661	
Wald test on phy. Cap.	5.87	0.015		
Wald test on emp.	12.67	0.000		
Wald test on HT	1.72	0.189		
Wald test on South	3.22	0.073		
Wald test on Export	0.01	0.913		
Wald test on family	3.98	0.046		
Wald test	217.5	0.000		