

# Owner-management and Productivity: Evidence from Italian firms

*Abstract.* Using Total Factor Productivity (TFP) as a measure of corporate performance, this study compares the performance of owner management to that of firms run by professional managers over the period 2004-2006. We find that Italian family run firms are less productive than firms run by professional managers, but the difference between the two is small. We control for some sources of heterogeneity and potential endogeneity of management regime. Our results support the idea that in Italy there is no genuine process of manager selection both for family and non-family firms. Moreover, the lack of separation between ownership and control, characteristics of the Italian market, induces tight control on management which may constrain the initiative of a professional manager and offset the potential positive effects.

*JEL classification:* D24, G34

*Keywords:* TFP, Family firms, Management

## 1. Introduction

A vast literature studies the behaviour and performance of family firms, without any conclusive results (Schulze and Gedajlovich, 2010 amongst others). The issue is particularly relevant in Italy, where the ownership and the control of companies are concentrated in the hand of family firms<sup>1</sup>.

Furthermore, no radical change occurred despite the regulatory changes introduced between 1990 and 2005 to upgrade the Italian legal and economic framework relative to financial market (Giacomelli and Trento, 2005; Mengoli et al., 2009).

Therefore, it is certainly worth investigating the role of ownership structure in Italy, a country characterised by a slow growth rate over the last 15 years, when—compared to previous experience and to international competitors. One of the proposed explanations of sluggish economic growth is that the governance system has limited the size of firm which translates into a low presence in international markets and a specialisation in traditional sectors (Bank of Italy, 2009; Bianchi et al., 2005). Indeed, family run firms tend to be characterised by prudence in strategic decision-making, due to the close connection between family and firm assets. Moreover, such firms demonstrate a reluctance to resort to outside managers, even when there is a shortage of internal resources (Bank of Italy, 2009). These characteristics, which may have a negligible effect in periods of stable growth, can render the system incapable of dealing with the competitive pressures resulting from globalisation.

Many papers have analysed how family ownership affects Italian firms' behaviour and performance defined in several ways (Bandiera et al., 2008; Barba-Navaretti et al., 2008; Bianco et al., 2009; Bloom et al., 2008; Cucculelli and Micucci, 2008; Lippi and

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<sup>1</sup> A possible consequence of the lack of separation between ownership and control is the presence of weak managers, strong block-holders and unprotected minority shareholders (Mengoli et al, 2009).

Schivardi, 2009; Sciascia and Mazzola, 2008), but no research has examined the relationship between family management and total factor productivity (TFP). In this paper, we make an attempt at filling this gap.

The focus is on management and not on ownership because, as has been claimed (Barth et al., 2005; Bloom et al., 2007; Bloom et al., 2008; Hart, 2001; Sciascia and Mazzola, 2008), more than the mode of ownership *per se*, it is the management that may affect the economic performance of a firm.

We use TFP because it can be considered a proper measure of firms' performance for several reasons. First, unlike financial measurements (ROE, ROI, Tobin's Q), productivity is less exposed to manipulation by accountants (Palia and Lichtenberg, 1999). Second, TFP intrinsically determines the equilibrium value of financial variables, such as profit and stock price (Griffell-Tatje and Lovell, 1999). In addition, performance measures based on market prices can be used only if the stock market is efficient (Brealey and Myers, 2000), which is not the case for Italy. Moreover, the use of measures based on market prices enables researchers to consider only listed firms which are just a small percentage of firms, while our sample combines both listed and non listed firms. Finally, many contributions have shown how Italy's productivity slowdown, observed over the last years, can be attributed to total factor productivity (amongst others OECD, 2007; Van Ark et al., 2007).

The main contribution of this study is to empirically assess whether firms run by a member of the owner family are more or less productive than firms run by professional managers, using TFP as measure of firms' performance rather than firm value or profitability that tend to be used in other studies. To our knowledge, no published paper explored this issue for the Italian market and there is extremely limited empirical evidence on this subject in international literature. We believe this study makes other two contributions. First, we provide useful information on the main characteristics of the Italian corporate governance model considering both listed and non listed firms. Second, we contribute to the debate on the difficulties of Italian economy focusing on the role of family management in explaining poor performance.

The empirical evidence is based on data from the Xth Capitalia-UniCredit survey (2008) collected through a questionnaire sent to a sample of Italian manufacturing firms and complemented with balance sheet data. TFP is estimated at firm level by using the Levinshon and Petrin (2003) approach. We compare the TFP of owner management to that of firms run by professional managers using standard ordinary least squares over the period 2004-2006. We control for sources of heterogeneity and potential endogeneity of management regime.

The findings demonstrate that professional managers outperform owner-managers, though the difference between the two is small.

The work is organized as follows. In the following section we present a review of the theoretical issues and empirical evidence. We then describe the sample and provide the descriptive analysis. In the subsequent section we illustrate methodology and results. Finally, we present some robustness checks and we control for endogeneity of management regime. The last section concludes, while the Appendix provides information on methodology used to estimate TFP.

## 2. Owner management and performance in prior literature

A number of studies have investigated the impact of family influence on the performance of a firm<sup>2</sup>. The relevant literature is, in many ways, divided on the view that concentrated family ownership as well as owner-management may have beneficial economic consequences. Two different perspectives are used- agency theory and stewardship theory- each revealing evidence for and against the benefits of family involvement (Chrisman et al., 2005; Miller and Le Breton-Miller, 2009).

As to the distinction between owner-management and non-owner management, agency theory would predict a positive effect on value of firms, because owner-management aligns the interests of owners and managers (Jensen and Mechling, 1976). Yet, this effect may be offset by the costs of family management. Family managers are not recruited from the general market for managers. This situation generally leads to a lower quality among owner-managers than professional managers and may reduce a firm's productivity. Moreover, family run firms tend to be characterised by prudence in strategic decision-making, due to the close connection between family and firm assets. This risk aversion may prevent owner-managers from adopting new and productivity-enhancing management principles as they are considered too risky or break with business and family traditions.

Stewardship is another informative perspective to view the advantages and disadvantages of a family business. Stewardship theory posits that many leaders and executives identify themselves with the organization (Davis et al.1997). This attitude will be especially prevalent among family businesses in which leaders are either family members or emotionally linked to the family. There may be a strong incentive for family owners and executives, therefore, to act in the long-run interests of the company and all its stakeholders by investing in new processes, products and marketing (Habberson and Williams, 1999; Sirmon and Hitt, 2003). However, other researchers suggest that many of the advantageous attributes can become disadvantages, due to conflicts of interests within the family, or distort incentives due to altruism or kinship behaviour (Gomez-Mejia et al., 2001; Schulze et al., 2002).

From a theoretical point of view, therefore, the effect of family management on firm performance remains an open issue. These conflicting ideas have recently evoked a number of empirical examinations of the relationship between family management and firm performance. Even the empirical evidence provides no uniform answer. Although not entirely conclusive, many contributions on different countries show that family firms are more profitable or show higher market valuation when managed by the founder. On the other hand, negative effects emerge when descendant runs the firm<sup>3</sup>. The only exceptions to this consensus are some studies on France (Sraer and Thesmar, 2007), on Italy (Favero et al., 2006) and on continental Europe (Barontini and Caprio, 2006) which find that family owned firms, first or later generations, perform better than firms with widely held ownership structures.

Very few empirical studies have analysed the impact of family management on productivity and the results are mixed. Palia and Lichtenberg (1999) and Martikainen et

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<sup>2</sup> For a survey of the literature see Chrisman et al. (2010), Matias and Galvão (2010), Schulze and Gedajlovich (2010).

<sup>3</sup> Adams et al. (2009), Anderson and Reeb (2003), Pérez-González (2006), Villalonga and Amit (2006), for US; Bennedsen et al. (2007) for Denmark; Bertrand et al. (2008) for Thailand; Cucculelli and Micucci (2008) for Italy.

al. (2009) find a positive effect for US firms. Barth et al. (2005) document a negative relationship between family management and firm productivity for Norway.

As far as the authors are aware, similar studies for Italy have yet to be seen<sup>4</sup>. Some papers have analysed the performance of family managed firms using market-based and accounting-based performance. Most of these have found that family firms and family run firms perform worse (Caselli and Di Giuli, 2009; Sciascia and Mazzola, 2008)<sup>5</sup>. Other studies focusing on the founder effect provide mixed results. Cucculelli and Micucci (2008) find a positive founder effect followed by a marked drop in the post-succession performance. On the other hand, Favero et al. (2006) show that family owned firms, first or later generations, perform better than firms with widely held ownership structures. Other papers focus on management practices. Bloom et al. (2008) show that Italian entrepreneurs are reluctant to formally hand over the management of the firm to outside figures and this may have severe productivity implications. In the analysis of the ways in which managers are hired and incentives offered, Bandiera et al. (2008) confirm these findings<sup>6</sup>.

### 3. Data and descriptive statistics

This section presents firms' characteristics according to type of ownership and management. The data are drawn from the Xth Capitalia-UniCredit survey (2008), which was compiled on the basis of the information collected in a questionnaire sent to a sample of Italian manufacturing firms and complemented with balance sheet data<sup>7</sup>. The survey, which covers a sample of firms with 11 to 500 employees and all firms with over 500 employees, is the most complete source of information on the Italian manufacturing system, in particular medium and large firms.

In the literature, there is no single definition of a family business (Astrachan and Shanker, 2003; Chua, 1999; Miller et al., 2007). In this paper information on ownership (whether the firm is family-owned or not) and on owner-management is based on response to a specific question on ownership and management included in the Xth Capitalia-UniCredit questionnaire (2008)<sup>8</sup>.

We distinguish firms by ownership type and by management regime, but our focus here is on family management rather than ownership. As regards management, we

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<sup>4</sup> Lippi and Schivardi (2009) use TFP as a measure of performance, but their aim is to test if the owners of the firm enjoys a private return from employment relationship with the managers, using a sample of Italian manufacturing firms over 1984-1997. They find that government and family firms have a larger share of senior managers, display lower values of TFP and are characterized by a negative relation between TFP and the share of senior manager.

<sup>5</sup> Caselli and Di Giuli (2009) show that the family firms with a non family Chief Financial Officer (CFO) perform better than both family firms with a family CFO and non family firms. Sciascia and Mazzola (2008) find a negative quadratic relationship between family involvement in management and performance, but no association between family involvement in ownership and performance.

<sup>6</sup> Other works, that focus on firm behaviour, stress how the greater risk aversion of Italian family firms can influence investment decisions (Bianco et al. 2009) or the decision to enter foreign markets (Barba-Navaretti et al., 2008).

<sup>7</sup> The questionnaire refers to 2004-2006 and contains information on firm structure, ownership structure, workforce composition, physical capital and innovation, as well as the degree of internationalization. The balance sheet data refer, instead, to 1998-2006.

<sup>8</sup> We define family firms as those controlled or owned by an individual or a family. Our information on owner-management are based on response to the following question: *If your company is controlled or owned by an individual or a family who runs the company? (1) the person who owns or controls the company or a member of the family that owns or controls the company; (2) a manager hired from outside the company; (3) a manager hired from inside the company.*

distinguish three types of firms: (i) family firms run by a family member (*owner management*); (ii) family firms run by a professional manager outside the family (*outside management*); and (iii) a broader category including both the family firms run by a manager outside the family (point ii) and non-family firms which are presumably also run by a professional manager (*professional management*)<sup>9</sup>.

Table 1 provides descriptive statistics for our sample broken down by ownership type (family and non family firms) and by management regime (owner management, outside management, professional management). It reports average values of a number of variables for 2006, among the others TFP estimated with Levinsohn and Petrin approach<sup>10</sup>. The TFP and the distribution of our sample (in parentheses) are reported on the basis of some firm characteristics, such as the relevance of exports and innovation<sup>11</sup>, Pavitt sector, size and territorial distribution<sup>12</sup>. Family firms make up 63% of the sample (1,835 out of 2,920 firms) and 90% of these are run by a family member (1636 out of 1835). This evidence confirms that family firms play an important role in economic activity and family members tend to be actively involved in the management of the company (Bank of Italy, 2009; Giacomelli and Trento, 2005), highlighting the difference between Italy and other countries. The difference lies not so much in the importance of family groups within the economy as this phenomenon is common in other countries (La Porta, 1999; Faccio and Lang, 2002), but rather in the fact that family management is the dominant form of management (Bianchi et al. 2005; Bloom et al., 2008; UniCredit, 2008).

The firms considered are representative of the Italian industrial structure: they operate predominantly in traditional sectors (50% for firms run by family, while the figure is 46.2% for firms managed by professional manager) and are located in Northern Italy (around 75%), a high percentage of which are exporters (67.1% of firms run by a family manager and 69.5% for others)<sup>13</sup>. The companies run by a family manager show a higher share of small and medium firms (only 6.4% have over 250 employees, while this figure rises to 12.4% for firms run by professional manager) Only a small number of firms are listed (0.7% for family run firms and 3.1% for firms run by a non-family manager) which indicates the preference for control and the consequent reluctance to look for outside investors. We do not find relevant differences in the distribution of firms according to the ownership vis-à-vis management regime. On average family

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<sup>9</sup> The choice to consider professional management in family and non-family firms jointly finds support in Bloom et al. (2008). Their results show that family owned firms run by external management are statistically undistinguishable from non family firms.

<sup>10</sup> See Appendix for details.

<sup>11</sup> The status of exporting is available in Xth wave of UniCredit-Capitalia survey, given by the answer to the question “Did you export in 2006?”. We consider innovative any firm that claimed in the questionnaire to have carried out innovations in the period 2004-2006.

<sup>12</sup> The original data refer to 5,100 firms. In order to estimate TFP we carry out a data cleaning procedure: we eliminated the firms which presented negative values of value added from the original archive and firms with a growth rate of value added and of employees below the first or above the ninety-ninth percentile of the distribution. Finally, firms for which at least 7 years data regarding employee numbers was not available were also excluded. After the cleaning procedure our sample is equal to 2,920 firms.

<sup>13</sup> The percentage of exporting firms in the sample is 68% as opposed to 17% according to Italian National Statistical Institute (ISTAT, 2008). This might be a consequence of the fact that, in the UniCredit-Capitalia sample, the firms with fewer than 10 employees are not considered and there are few firms with less than 50 employees. These firms are characterized by a low degree of internationalization: exporting firms make up only 10% of those firms with fewer than 9 employees and 46% of those with 10 to 50 employees, while this figure becomes 78% for firms with more than 50 employees (ISTAT, 2008).

managed firms' value added, number of employees, physical capital, white collar share, labour productivity (value added/number of employees) are lower than firms run by professional managers. More importantly, the TFP is lower both overall and for all the sub-samples of firms considered: listed and non-listed, exporters and non exporters, innovators and non innovators, Pavitt sector, size and territorial area (column 3 and 5). Even when we consider ownership, table 1 reveals that non-family firms perform better for all the indicators and subgroups considered.

Table 1. Firms' characteristics by ownership and management type (average values)

	Ownership		Management regime		
	Family firms	Non-family firms	Owner-managed family firms	Outside management in family firms	Professional management (family and non-family firms)
Value added	54406	92764	53881	86651	91807
Number of employees	95	136	86	167	141
Physical Capital	52744	71836	47207	98679	76039
Age	33	32	33	33	33
White collar share	37.9	43.6	38.2	35.2	42.3
Labour productivity	550	584	548	572	582
TFP	845	934	833	950	936
<i>Listed</i>	1268	1533	1132	1449	1519
	(1,0%)	(3,0%)	(0,7%)	(3,5%)	(3,1%)
<i>Export status</i>					
Exporters	878	968	865	967	968
	(68,5%)	(67,6%)	(67,1%)	(79,9%)	(69,5%)
Non exporters	774	864	766	889	866
	(31,1%)	(31,8%)	32.5	19.6	29.9
<i>Innovation status</i>					
Innovators	879	934	868	968	940
	(59,0%)	(56,9%)	(58,6%)	(62,8%)	(57,8%)
Non innovators	791	946	775	942	946
	(35,7%)	(37,8%)	(36,4%)	(30,2%)	(36,6%)
<i>Pavitt Sectors</i>					
Supplier dominated	765	809	756	854	816
	(49,9%)	(46,5%)	(50,6%)	(44,2%)	(46,2%)
Scale intensive	921	1071	898	1104	1076
	(19,1%)	(18,9%)	(19,1%)	(19,6%)	(19%)
Specialised suppliers	910	989	902	965	985
	(26,8%)	(29,4%)	(26%)	(32,7%)	(29,9%)
Science based	1026	1241	1016	1116	1226
	(4,3%)	(5,2%)	(4,3%)	(3,5%)	(4,9%)
<i>By class of employees</i>					
Small (11- 50 )	720	764	715	776	766
	(57,3%)	(53%)	(58,8%)	(45,2%)	(51,8%)
Medium (50-250)	955	997	948	1007	999
	(35,5%)	(34,7%)	(34,8%)	(41,7%)	(35,8%)
Large (>250)	1326	1530	1316	1365	1502
	(7,1%)	(12,3%)	(6,4%)	(13,1%)	(12,4%)
<i>By territorial area</i>					
North	864	958	849	988	962
	(74,8%)	(75,2%)	(74,9%)	(74,4%)	(75,1%)
Center	848	872	843	884	875
	(15,6%)	(15%)	(15,3%)	(18,1%)	(15,5%)
South	692	838	691	700	822
	(9,5%)	(9,8%)	(9,8%)	(7,5%)	(9,4%)
N. observations	1835	1085	1636	199	1284

All variables computed for 2006. Data in value deflated and expressed in euros. In parentheses shares with respect to the total of the column. The share for exporting/non exporting firms and innovating/non innovating firms may not sum to 100 since some firms did not answer the questions in the survey.

Source: elaborations on data from UniCredit-Capitalia (2008)

## 4. Empirical strategy and main results

The analysis of simple summary statistics does not, of course, allow us to isolate the possible effects on productivity of other covariates. In order to disentangle the effect of family management and other factors on firm productivity, therefore, we turn to an econometric analysis. To investigate whether firms run by a member of the owner family are more or less productive than firms run by professional managers, we estimate a TFP equation of the form:

$$\omega = \beta_0 + \beta_1 D_{FM} + \sum_{j=1}^k \gamma_j X_j + \sum_{s=1}^v \eta_s D_s + \varepsilon \quad [1]$$

where  $\omega$  is the firm TFP (in logarithm) estimated by using Levinsohn and Petrin's approach<sup>14</sup>,  $D_{FM}$  is a binary variable taking the value one if the firm is run by a member of the owner family and zero otherwise,  $X$  a vector of firm-level variables highlighted by previous literature as important drivers of TFP and  $D$  a set of sector dummies, grouping firms according to both the Pavitt taxonomy and the ATECO sub-sections<sup>15</sup>, and territorial area dummies. Our parameter of interest is  $\beta_1$  that measures whether firms managed by a member of the owner family are more or less productive than non-family-managed firms. Firm characteristics include: firm size (measured by the log of employment); the log of firm's age in 2006; a dummy variable equal to one if a firm is listed on the stock market; the share of white collar workers on total employment as a proxy for human capital<sup>16</sup>.

Equation [1] is estimated by standard ordinary least squares<sup>17</sup> considering average values of 2004-2006 period for TFP and employment<sup>18</sup>.

Table 2 reports the empirical estimates from the TFP equation on all manufacturing firms. We found that family-managed firms are, on average, 5.3% less productive than non-family firms when we only control for firm size (model 1)<sup>19</sup>. The results do not change when we consider age, whether the firm is listed, Pavitt sectors and territorial area (model 2). By adding human capital (model 3), we get a picture of the sensitivity of the relationship between family management and productivity to differences in human capital. The productivity gap decreases by a 1.3 percentage point and this could reflect the fact that firms run by a family are less intensive in human capital<sup>20</sup>.

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<sup>14</sup> TFP is estimated over the period 1998-2006. See appendix for details.

<sup>15</sup> ATECO is the classification of economic activities adopted by Italian Statistical Institute. This classification is the national version of the European nomenclature, Nace Rev. 2.

<sup>16</sup> Among the firm-level predictors the correlation coefficients are very low, which confirms that these variables capture distinct characteristics of firms and that the results do not suffer from a serious problem of multicollinearity of firm predictors (the correlation matrix is available on request).

<sup>17</sup> This equation probably suffers from omitted variable problems since unit heterogeneity is not considered. One way to allow for unobserved heterogeneity is the fixed effects model. However, panel data analysis cannot be performed, due to the lack of time series in management variables.

<sup>18</sup> We use TFP and employment in the form of three-year averages over the period of the survey (2004-2006) to limit influence of shocks and measurement errors in specific years. Moreover, the use of the three-year averages limits the extent of missing data, nevertheless the results using 2006 values (not reported here) are very similar.

<sup>19</sup> Percentage differences in TFP can be obtained as  $[\exp(\beta_1) - 1] * 100$ , where  $\beta_1$  is the estimated coefficient associated to the management regime dummy.

<sup>20</sup> The assumption is that the parameters for white collar share are the same for family managed and non family managed firms. We have tested this assumption by introducing an interaction effect between the white collar share and  $D_{FM}$ . Since the coefficient of this interaction effect is statistically insignificant, we can accept the hypothesis of the equality of human capital parameters.

Tab. 2 The owner-management in family firms and productivity

	Model 1	Model 2	Model 3	Model 4	Model 5 <sup>1</sup>	Model 6
Intercept	5.899*** (169.29)	5.799*** (121.26)	5.622*** (109.37)	5.785*** (104.45)	5.555*** (85.98)	5.621*** (109.75)
Manager from the owner family	-0.054*** (-3.48)	-0.053*** (-3.46)	-0.040*** (-2.63)	-0.037*** (-2.49)	-0.031 (-1.10)	-0.034** (-2.28)
Foreign ownership						0.127*** (3.29)
Log number of employees	0.199*** (24.82)	0.195*** (24.98)	0.209*** (26.34)	0.210*** (26.36)	0.208*** (22.67)	0.207*** (25.97)
Log age		0.015 (1.27)	0.018 (1.55)	0.010 (0.88)	0.035** (2.50)	0.019* (1.66)
Listed firm		0.161*** (2.67)	0.128** (2.17)	0.128** (2.07)	0.152 (1.67)	0.122** (2.07)
White collar share			0.283*** (8.81)	0.269*** (8.39)	0.315*** (8.49)	0.277*** (8.63)
Sectors	no	yes (Pavitt)	yes (Pavitt)	Yes (ATECO)	yes (Pavitt)	yes (Pavitt)
<i>F-sector test</i>		40.07***	31.83***	18.45***	18.24***	30.10***
Territorial area	no	yes	yes	Yes	yes	yes
<i>F-area test</i>		15.06***	13.13***	21.61***	12.97***	13.29***
R <sup>2</sup>	0.22	0.28	0.31	0.34	0.30	0.31
F-statistics	332.69***	121.12***	120.69***	70.85***	74.31***	113.42***
White test statistic	21.51***	68.22***	90.71***	185.67***	44.55	90.06***
Number of observations	2876	2802	2795	2795	1763	2795

Dependent variable: log of TFP (average values for 2004-2006 period). A White test for heteroskedasticity is performed and when evidence of heteroskedasticity is found OLS regressions are based on the White heteroskedasticity consistence covariance matrix.

In parentheses t-values. Level of significance: \*\*\* 1%, \*\* 5%, \* 10%.

(1) Model 5 refers to family-owned firms only.

In model 4, the family management relationship is not altered by the inclusion of industry dummies at the ATECO sub-sections level instead of Pavitt classification.

When we consider only family-owned firms and compare owner management with outside management (model 5), the productivity differential is still negative, but not statistically significant.

In model 6 we introduce a dummy for foreign ownership and find that the productivity differential between family run firms and the others is smaller (-0.034 instead of -0.04). Moreover, the coefficient of the dummy for foreign ownership is positive and significant giving evidence, as previous empirical literature (Barba Navaretti and Venables, 2004), that foreign firms are more productive than domestic firms. Unreported estimates show that this difference persists even if we consider only non-family owned firms.

## 5. Robustness of the results

Our evidence on productivity differentials is obtained as an average for the whole manufacturing sector. The results could, therefore, stem from some underlying heterogeneity rather than from differences in management structure. In order to take this

into account and check the robustness of our results, we split our sample into different groups. In fact, family management could have a different impact depending on the sector, size or location of the firms. This last point is especially crucial for Italy where, as is well known, a territorial dualism persists. To control for these sources of heterogeneity, we compute the effect of family firm management separately for size (small, medium, large), location (North, Centre, South) and sector, grouping firms according to the Pavitt taxonomy. Moreover, in the literature heterogeneity within sectors is either explained by self-selection of more efficient firms in the export market (Melitz, 2003)<sup>21</sup> or in terms of innovation (Klette and Kortum, 2004). For this reason, the sample is broken down in subcategories according to export status and innovative activity.

Table 3 reports results of these robustness checks on model 3 with the focus on the managerial regime dummy coefficient. Estimates show that the dummy's coefficient is negative in all groups, while there are differences in the statistical significance and magnitude of productivity gaps.

In terms of sector characteristics, interesting results emerge from the heterogeneity analysis: only scale intensive firms display a statistically significant coefficient for the family management dummy, with an even stronger effect than the one found in the full sample, indicating a gap of 11%. However, for the specialised suppliers group that includes the machine and machine tools industry, the backbone of the Italian model of international specialisation, there is no substantial difference between the two management regimes.

Moreover, the findings indicate that while for the northern firms the productivity gap is significant, for firms located in the central and southern part of the country we find no significant effect.

The small firms are the ones where the family management effect is stronger and statistically significant, while for medium firms there is almost no difference between the family run enterprises and the others.

Finally, the findings provide evidence that even when exporting, family run firms are less productive than others, while the coefficient for non exporters is not statistically significant. On the contrary, the coefficient of the managerial regime dummy is more pronounced in the sample of non innovative firms than in the full sample as indicated by a productivity gap of more than 7%, while there is no significant difference for innovators.

In conclusion, two main findings emerge from our analysis. First, for all specifications and groups of firms, enterprises run by a member of the owner family are less productive than those run by non-family managers. Second, even if the results are robust when considering different sub-samples, the effect of the managerial regime is not homogeneous, rather it varies depending on the firm's characteristics. Productivity gaps between firms managed by professionals and owner-managed family firms are significant for small businesses, exporting firms, firms that do not innovate, those belonging to the scale intensive sector and firms located in Northern Italy.

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<sup>21</sup> In the case of Italian firms, several works provide empirical support to the prediction of the self-selection hypothesis that only firms which are efficient enough to bear entry costs and the intense competition of the export market will export (Castellani, 2002; Castellani and Giovannetti, 2010; Serti and Tomasi, 2008).

Tab. 3 Robustness checks

<i>Sub-samples</i>	Model 3
<i>Coefficient of the Manager from the owner family dummy</i>	
<i>Pavitt sectors</i>	
Supplier dominated	-0.030 (-1.35)
Scale intensive	-0.117*** (-3.13)
Specialised suppliers	-0.005 (-0.18)
Science based	-0.020 (-0.28)
<i>Territorial area</i>	
North	-0.045*** (-2.67)
Center	-0.004 (-0.11)
South	-0.025 (-0.42)
<i>By class of employees</i>	
Small (less than 50 employees)	-0.044** (-2.26)
Medium (50-250)	-0.006 (0.25)
Large (>250)	-0.062 (-1.16)
<i>Exporters</i>	-0.036** (-2.07)
<i>No exporters</i>	-0.047 (1.57)
<i>Innovators</i>	-0.017 (-0.84)
<i>Non innovators</i>	-0.077*** (-3.05)

Dependent variable: log of TFP (average values for 2004-2006 period).

In parentheses, t-values based on heteroskedastic-robust standard errors.

Level of significance: \*\*\* 1%, \*\* 5%, \* 10%.

## 6. Discussion on endogeneity biases

Our results could potentially suffer from the problem of endogeneity. If for family firms the decision to run the firm or to hire a professional manager is correlated with unobservables that affect TFP, problems arise because standard regression techniques

lead to biased and inconsistent estimators<sup>22</sup>. Since our dependent variable is a function of a binary choice, we use the treatment effect model that allows us to consider the effect of an endogenously choice binary treatment on another endogenous continuous variable, conditioned on two sets of independent variables. Using the treatment effect model, we limit the analysis to family-owned firms in order to identify the average effect of family management on family firms with respect to productivity. The sample is, thus, divided into the treated (owner managed family firms) and the untreated (family firms run by professional managers) and the treatment (family management) is an endogenous process. Following Wooldridge (2002), we use a two-step instrumental variable (IV) method<sup>23</sup>. In the first step a probit model is considered to estimate the probability of being a firm managed by a family. In the probit model, the regressors are the same controls used for the OLS as well as a dummy variable that is equal to one if, in the survey, the first stockholder claims to participate to an agreement to vote. We consider this variable as a proxy for the family's preference for control and, thus, a determinant of the family decision to keep the management of the firm<sup>24</sup>. In the second stage the equation [1] is estimated using the fitted probabilities derived from the first step as instruments.

Table 4 presents the treatment effect model along with lambda parameter that verifies the presence of endogeneity in the original model<sup>25</sup>. Since the lambda coefficient is not significant, we cannot reject the OLS model. The evidence presented in this paper, therefore, is not driven by endogeneity of family management status.

This finding is consistent with empirical evidence that Italian family firms stick with their management even in economically hard times (Brunello et al., 2003; Volpin, 2002; Lippi and Schivardi, 2009)<sup>26</sup>.

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<sup>22</sup> Another source of endogeneity could be related to size and white collar variables. We test the robustness of our results by employing instrumental variables method using 2006 data. Size and white collar share are instrumented by the log of employment and the average schooling of the labour force in 2004, respectively. The last indicator is a weighted average of the years of schooling of the labour force using as weights the share of labour force in relation to the education levels. The results confirm the negative coefficient for management dummy. This is significant when we instrument only for size. On the contrary, the management dummy effect is not statistically significant when we instrument only for white collar share or for both variables.

<sup>23</sup> We use the `treatreg` subroutine of the Stata package (Cong and Drukker, 2000).

<sup>24</sup> For the probit we need a variable that affects the choice of the management type by the family owner but does not have a partial effect on TFP. In order to test this hypothesis, we regress TFP on the dummy variable for the presence of an agreement to vote. We find that the coefficient is not statistically significant.

<sup>25</sup> The lambda parameter is  $\lambda = \sigma\rho$  where  $\rho$  is the correlation between error term of equation [1],  $\varepsilon$ , and the error term of the probit model. If the correlation between the error terms  $\rho$  is zero, then  $\lambda = 0$  and the problem reduces to one estimable by OLS; if  $\rho$  is positive (negative),  $\lambda > 0$  ( $\lambda < 0$ ) and OLS overestimates (underestimates) the treatment effect.

<sup>26</sup> Brunello et al. (2003) show that the probability of a change of Chief Executive Officer (CEO) after poor performance is reduced when the CEO owns some shares of the company or is a member of the owner family. Volpin (2002) evidences that the probability of top management replacement and the sensibility of this change to the company results are significantly lower if the manager belongs to the family that controls the company. Lippi and Schivardi (2009) find owner of family firms select managers almost only on the basis of the private benefits: they keep all the managers with whom they have developed a relationship, regardless of ability, and fire all the others. This mechanism completely inhibits the selection effect of managerial ability.

Tab. 4 Treatment effects model of family management on family firms

	1st stage: Probit model	2nd stage
Intercept	1.531*** (5.84)	5.802*** (23.87)
Manager from the owner family		-0.285 (-1.18)
Log number of employees	-0.210*** (-5.23)	0.198*** (14.40)
Log age	0.120** (1.93)	0.041*** (2.67)
Listed firm	-0.844*** (-2.6)	0.084 (0.74)
White collar share	0.244 (1.35)	0.322*** (8.39)
Agreement to vote	0.269*** (3.27)	
Sectors	yes (Pavitt)	Yes (Pavitt)
Territorial area	yes	Yes
rho		0.355
sigma		0.377
lambda		0.134
Wald test		771.73***
Number of observations	1763	1763

Sample refers to family-owned firms only. Level of significance: \*\*\* 1%, \*\* 5%, \* 10%.

## 7. Conclusions

Using TFP as a measure of firm performance, this study compares the influence of owner management to firms run by a professional manager. The analysis allows us to show the main features of the corporate governance model of Italian companies, a large proportion of which are family owned and family run. Firms not run by the owner family are larger, more productive, and their workforce is more skilled than their family run counterparts. On average, their TFP is higher both overall and for all the subgroups of firms considered: export status, innovative activities, Pavitt sector, size and territorial area.

The econometric analysis based on a sample of Italian manufacturing firms shows that family managed firms are, on average, 5% less productive than non-family managed firms after controlling for sector, area, as well as other characteristics, such as age and being listed on the Stock Exchange. We also find that the TFP gap drops to 4% when we include the share of white-collar employees, suggesting that this factor contributes to the productivity gap.

In order to take into account heterogeneity, we consider the influence of owner management for subgroups of firms. The effect of the managerial regime is still

negative: the result varies with respect to the firm's characteristics, both in the statistical significance and in the magnitude of productivity gap, but not in the sign.

In line with the empirical evidence that Italian family firms stick with their management even in economically bad times, we do not find any support for the hypothesis of endogeneity of family management status.

Furthermore, our results are consistent with previous studies on Italian firms such as Caselli and Di Giuli (2009), Lippi and Schivardi (2009) and Sciascia and Mazzola (2008), which found, that family run firms perform worse than non-family managed firms. However the difference between the two is small (around -4%), especially if we compare with the result reported by Barth et al. (2005) for Norwegian firms (-14%).

This result may reflect the system of manager selection in Italy. As Bandiera et al. (2008) show managers in non-family firms are more likely to be hired through formal channels than in firms with family ownership, albeit to a lesser extent than their international counterparts. Moreover, the lack of separation between ownership and control, characteristics of the Italian market, induces tight control on management; which may produce narrowly prescribed tasks, bureaucratic regulations, and centralization of authority all of which erode managerial initiative and capability.

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## Appendix - Measure of Total Factor Productivity

The TFP used in this paper has been estimated in Aiello et al. (2010). TFP at firm level is estimated by using Levinshon and Petrin’s approach (2003). Productivity was estimated using the following log-linear specification of a production function:

$$y_{it} = \beta_0 + \beta_K^{MAT} k_{it}^{MAT} + \beta_l l_{it} + u_{it} \quad (1')$$

with  $i = 1, \dots, N$  firms,  $t = 1998, \dots, 2006$  and where  $y$  represents the value added,  $l$  the number of employees,  $k^{MAT}$  the stock of physical capital,  $\beta_0$  measures the average efficiency and  $u_{it}$  represents the deviation of firm  $i$  from this average at time  $t$ . The error term can be decomposed into two parts:

$$u_{it} = \omega_{it} + \eta_{it} \quad (2')$$

where the term  $\omega_{it}$  represents the productivity of firm  $i$  at time  $t$  and  $\eta_{it}$  is a stochastic term which includes not only the measurement error, but also the shocks which are unobservable to firms, and, therefore, do not correlate with inputs.

Productivity  $\omega_{it}$  is known to the firm which, therefore, in the case of positive shocks to productivity, can decide to increase production by raising the level of inputs. This determines a problem of simultaneity which Levinshon and Petrin (2003) resolved by identifying in the demand for intermediate goods a proxy related to the variations in TFP known to firms.

Equation (1') was estimated by utilizing as proxy for the stock of physical capital the tangible fixed assets and the demand for intermediate goods was measured by the operating costs. The value added has been deflated by using the ISTAT production price index available for each ATECO sector. As regards the tangible fixed assets, data have been deflated by using the average production price indices of the following sectors: machines and mechanical appliances, electrical machines and electrical equipment, electronics and optics and means of transport. For the operating costs, we adopt the intermediate consumption deflator calculated by using data from ISTAT.