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## **Gender earnings differentials and pay structure of Italian family managers**

Mirella Damiani\* and Andrea Ricci\*\*

### **ABSTRACT**

This paper analyses a dimension of the gender pay gap that has received so far a limited attention and that concerns not the *level* but the *form* of pay. The econometric analysis we performed has considered a fairly homogenous type of occupation represented by family management and with a great bargaining power in setting their rewards. With this strategy we aim at estimating gender disparities not driven by sex segregation by positions in firm hierarchy, but disparities more likely linked to preferences and identity. Probit models have been estimated to test whether or not the difference between women and men in pay structure of family managers (fixed salary or variable earnings) is statistically significant. We obtain that the female presence in top executive jobs, even after controlling for a large set of firm and workplace characteristics, is associated with a substantial lower incidence of the variable payment component. These gender differences in the structure of compensation packages are confirmed by IV Probit estimates that address potential omitted variables and endogeneity biases. We conclude that human capital factors, sectoral segregation or differences between firms are not the only drivers of gender differentials in the form of pay. We also suggest that lower representation of women in variable earning schemes might be an indicator of their minor attitudes toward competition.

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## 1. Introduction

A recent growing literature based on laboratory experiments and on economic models of identity and work incentives contributes to explain gender disparities not only in terms of discrimination, work-family conflicts and human capital factors, but also on differentials in preferences and behavioural attitudes. However, much of this area of research considers gender pay differentials between workers in subordinate positions and less evidence is available for top corporate jobs. The scant evidence on gender diversities recorded in high levels of corporate hierarchy is partly due to the limited number of women who are represented in these positions, both in board rooms and in top management (Dezso and Ross, 2012). This low presence is particularly striking in the Italian economy where, before the introduction of female mandatory quotas of corporate boards approved by the Italian Parliament in 2011, only around 6% of board seats in listed companies were held by women, a percentage well below that recorded in Italian major competitors (Catalyst, 2013; EU Commission 2014). Concerning gender gap in firm leadership, however, evidence is mainly focused on board of directors of Italian listed companies (Bianco et al. 2011), but no data are offered for the vast majority of Italian non listed firms, whose ownership and control are mainly concentrated in the hands of families and that are characterised by the predominance of small business. Notice also that Italy is an interesting case study to analyse gender issues because, according to the Global Gender Gap Index that measures the inequality gap between women and men, in 2013, the country was only ranked number 97 (out of 142 countries), in the area of economic participation and opportunity, and its ranking was the lowest among EU economies.<sup>1</sup>

The contribution of this paper is to consider the intersection of two distinctive features of the Italian economy, the pervasive strong gender gap and the dominance of a model of governance based on family capitalism. In particular we first ascertain the presence of women in leadership positions, as top family managers. Secondly, we pass to verify whether under family direction, compensation structure of family management presents gender heterogeneities and a different incentive orientation between women and men. We dispose of a particularly rich dataset covering information of compensation structure of top management not only of listed firms, but virtually of all enterprises of the Italian market economy. The data set has also the advantage of offering information on a large array of personnel and firm characteristics which permits to account for most of the unobserved heterogeneity that usually affect most available studies on this field.

The paper is organised as follows. Section 2 briefly discusses the related literature; section 3 presents the data used and descriptive statistics; section 4 illustrates the econometric strategy employed and our estimation results; section 5 concludes.

## 2. Literature review

This paper attempts to links together two different themes: gender-based differences in adoption of diverse pay schemes and the top management compensation earned by family management. We thus reconsider two different areas of related literature. The first one concerns the gender compensation gap,

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<sup>1</sup> The Global Gender Index is elaborated by the World Economic Forum and the last report refers to data for 2013.

particularly among high-level managers, the second one focuses on agency problems occurring in firms under family leadership.

Concerning the first area, potential explanations of gender effects in pay elements may be highlighted by recent works on gender differences in risk taking, confidence and exposure to competition (see the reviews of Bertrand, 2010 and Azmat and Petrongolo, 2014). Indeed, pay schemes are the results of interactions between those that allocate these payments and those that receive these schemes (Kulich et al. 2011). Personal attributes of the receivers, and in particular women personal choices, are relevant features that contribute to reframing earning literature in a more comprehensive perspective (Kulich, Ryan, and Haslam, 2007; Gomez-Mejia, 2007), where the role of behavioral factors is accounted for.

#### *Risk*

The first gender disparity concerns risk. The use of variable earnings may be an incentive device, but the main constraint is that this device imposes additional risk. It means that the strength of the relationship between pay and performance should be designed taking into account the responses of who receive these payments (Prendergast, 1999) and, eventually, gender disparities in risk aversion. Indeed, related literature has shown that the degree of risk aversion may be an area where preferences differ by gender, as shown from 15 set of experiments (Charness and Gneezy, 2012). The surveys of experimental studies of Eckel and Grossman (2008) and Croson and Gneezy (2009) widely document that women are more risk averse than men. Concerning top executives, for Denmark, Parrotta and Smith (2013) find evidence of greater risk aversion among women. Similar results have been obtained for the UK listed companies by Kulich et al. (2011), who also signal that “risk aversion is most marked in relation to tasks or activities that are typically masculine” (p. 315)<sup>2</sup>. In addition if men have more equity-based pay, they should also have higher total pay to compensate for extra risk, as predicted by standard principal-agent theories (Adams and Ferreira, 2009). Analogous findings have been obtained for female social entrepreneurs by Estrin et al, (2014), confirming that “a gender pay gap may arise in part because male have different preferences for money, pay and risk” (Estrin et al, 2014, p.10).

In sum, the male lower risk aversion, with respect to that manifested by women, may explain the male stronger orientation to receive payments by results with respect to their female counterparts.

#### *Self-Confidence and Competition*

An additional factor that may cause women and men to make different choices over compensation schemes is self-confidence. Jackson et al. (1992) show that, regardless of occupational field, women had lower career-peak self-pay expectations than men. Barber and Odean (2001), analysing common stock investments, document that in areas such as finance, men are more overconfident than women and trade more excessively than their female counterparts; along similar lines, Bajtelsmit and VanDerhei (1996) find that women invest their pensions more conservatively than men.

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<sup>2</sup> Kulich et al (2011, p. 315) suggest that “risk attitudes may be socially constructed rather than innate, because “people’s expectations that women are risk averse may reinforce the gender gap by encouraging women to choose less risky pay packages. At the same time, such expectations may trigger negative reactions toward those women who do not comply with predominant gender stereotypes.”

A recently growing literature based on laboratory experiments reports that one potential source for observed gender imbalances is due to low entry rates of women in tournaments and a significant part of these low rates can be accounted for by gender differences in confidence. If men are more ‘overconfident’ in their success, especially in uncertain situations, one may observe that men are more likely to enter tournaments (where the winner takes all), whereas women prefer to be compensated piece-rate, as shown by the experimental study of Niederle and Vesterlund, (2007).

Recently, this line of research has received further support not only from experiments on students (Buser et al. 2014), but also by analyzing agents in the process of making economic choices in labor markets as in Flory, Leibbrandt, and List (2015). These latter authors find that women are relatively less likely to apply for a job with a competitive payment scheme than are men. Thus it may be expected that female beliefs about their relative performance with respect to competitors may explain why they more frequently ask for compensation methods more oriented to fixed salaries, rather than payment by results.

A related aspect is the existence of large gender differences in the propensity to choose competitive environments, because women may dislike performing when they are competing against others. Different attitudes of women who tend to ‘shy away from competition’, as shown by Niederle and Vesterlund, (2007) may end up discouraging a competitive climate in working places. The rationale behind this explanation, offered by Niederle and Vesterlund, (2007, p. 1070), is that “while the prospect of engaging in a future competition may cause women to anticipate a psychic cost and deter them from tournaments, men may anticipate a psychic benefit and instead be drawn to them” (Niederle and Vesterlund, 2007).

Likely, other experimental works, as Booth and Nolen (2012), find differences between the male and female competitive choices also suggesting that observed gender differences may reflect more social learning rather than ‘innate attitudes’<sup>3</sup>. In this perspective, surveyed by Booth and Nolen (2009), a behavioural approach may reveal a fruitful line of research. Indeed, other useful insights are obtained by considering gender differentials in preferences, as argued below.

#### *Preferences*

Another aspect of pay incentive schemes arises from the potential trade-off between extrinsic and intrinsic motivations, since contingent rewards may conflict with intrinsic motivation, so impairing performance (Benabou and Tirole, 2003) and also for this trade off gender differentials are conceivable.

For instance, for Sweden, Adams and Funk (2012) show that female and male firm directors differ systematically not only in their risk attitudes, but also core values. Andreoni and Vesterlund (2001) find sex differences in altruism, arguing that such systematic differences could be relevant whenever altruism may be a factor in economic decisions. One of these area of decisions concerns leadership: Rosener (1995) and Book (2000) find that female leaders encourage participation from their subordinates, favour inclusion, are more cooperative and less hierarchical. Dezso and Ross (2012) show that women in top management motivate women in middle management and improve firm performance when the firm’s strategy is focused on innovation.

Notice that intrinsic motivation, such as fairness and cooperative attitudes, represent important enforcement mechanisms for labour discipline and long-term

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<sup>3</sup> Booth and Nolen (2012) find that gender differences in risk preferences are absent in single-sex schools, but are present in coed schools.

employment relationships, mainly in workplace characterized by incomplete contracts (Fehr and Gächter, 2000). Also, as focussed by Akerlof and Kranton (2005, p.11), “sense of identity and attachment to an organization is critical to well-functioning enterprises”. Thus, as proposed by these authors, identity-enhanced models offer a new view of a variety of management policies and organizational behaviour and in these models, the importance of connecting pay of CEOs to firm performance is critically reconsidered. Indeed, top executives would have better incentives if their identity were bound up in their position in the firm. It also means that different sense of identity, related to specific behavioural and psychological traits of female managers, may play some role in explaining their compensation structure. These considerations seem relevant when female leadership favour cooperative attitudes in working places, encouraging the evolution of social norms, based on gift exchange, that enhance reputation, trust and learning processes. In the entrepreneurship literature, Bird and Brush (2002) argue that organizations under female control tend to have flatter structures and often develop relational and nurturing strategies.

Some evidence in this direction has been provided by the study of Schwartz and Rubel, (2005), based on a sample covering 70 countries. The authors find that men attribute more importance to self-direction values and power, although cultural context moderates gender differences. Furthermore, the study already mentioned of Adams and Funk (2012) find that female firm directors in Sweden are more benevolent and universally concerned, less power-oriented than men, less traditional and security-oriented than their male counterparts. Other studies based on game theoretic models try to ascertain the presence of gender differences in altruism and fairness, but this literature has so far provided mixed results (Azmat and Petrongolo, 2014). In any case, the survey contribution of Bertrand (2010) assesses that “There is a quite a lot of field evidence consistent with higher level of altruism and stronger preferences for redistribution among women”(p.1555).

In our perspective, although the external validity of available laboratory studies has to be considered with caution and to date only a limited amount of research explores their role on labour market outcomes (Bertrand, 2011), we may hypothesize that gender differences in preferences and behavioural traits may play a role in earnings’ structures. Thus, we expect that if men are less risk averse, more self confident and more oriented to competition they more frequently voluntarily ask for variable payments, whereas women prefer non competitive piece rates. We will verify this hypothesis below for the Italian family managers.

Concerning the second theme, as shown in related literature (Shleifer and Vishny, 1997), it is widely acknowledge that controlling owners, such as the case of family firms, are able and motivated to exercise control by obtaining significant gains by their monitoring activity, thus in these firms the classic owner-manager conflict referred to as Agency Problem I (Jensen and Meckling, 1976), is mitigated by the presence of family controlling owners. It implies that executive rewards might be lower and a lower *level* of managerial salaries is accompanied by a *weaker link* to company performance (McConaughy, 2000). However, also in family business firms, as argued by Morck and Yeung (2003), managers may act in the interests of the controlling family, but not in those of firm’s stakeholders, such as other minority owners or employees. Therefore, in these enterprises the entrenchment of controlling families and the frequent use of pyramidal groups to separate ownership from control are conducive to new conflicts of interest, i.e. to a second type of conflict (Agency problem II). Therefore, also in these enterprises,

to mitigate the disalignment of interests of majority owners and other firm's stakeholders, a share of management rewards may include payments sensitive to performance, such as cash bonuses and equity compensation.

However, the adoption of these variable payments raises many issues, also related to preferences and attitudes of agents. Among others, two main controversial issues are trade-offs between incentive effects and exposure to risk, and between extrinsic and intrinsic motivations. Here potential gender disparities may come to forefront, as discussed above.

### **3.Data and descriptive statistics**

#### **3.1 Data**

Our empirical analysis is based on information obtained by the Employer and Employee Surveys (RIL) that were conducted by ISFOL in 2010 on a representative sample of partnerships and limited liability firms that operated in the non-agricultural private sector. The ISFOL-RIL survey collects a rich set of information about employment composition, personnel organization, industrial relations and other workplace characteristics. The questionnaire also collects information regarding some characteristics of corporate governance (ownerships/control and management structure). In particular, each firm was asked if it is owned or controlled by a family (Family Firm) and if the person who manages the enterprise is a member of the family that owns and/or controls the company, or is a professional manager (not a member of the family owner). Then we selected the subsample of firms run by family members, who are expected to have more discretionary power in setting the composition of their rewards. Concerning this latter variable, i.e. compensation of family managers which is the key dependent variable of our estimates, each firm was asked whether its top manager receives only a fixed salary or also a variable pay (cash bonuses and equity compensation) linked to some indicators of enterprise performance. Thus we have a dummy variable  $VE_i$  that is equal to 1 if the compensation of top management of firm  $i$  includes a variable component and 0 otherwise. This binary dependent variable thus indicates only the payment or non-payment of a variable pay scheme, not its detailed components.

Other information on top managers concerns gender, as well as age and educational levels. Furthermore, from the dataset, we obtain information on other firm personnel policies (such as the use of fixed-term contracts), industrial relations (such as the bargaining of variable payments for the workforce, linked to the enterprise performance).

The questionnaire also asks whether the firm is: i) a unit of a national group (National Group); ii) a division of an international group (International Group); iii) does not belong to any group (No Group). In addition, we control for sectors and regions (NUTS 1) in which firms are located. We also excluded firms with less than five employees to retain only those firms characterized by a minimum level of organizational structure. However, in a second step, as an additional robustness check, we also performed estimates for two subsamples, the first includes only micro-firms (those with less than 10 employees) whose incidence in Italy is the highest in Europe (in 2008 their share of total value added was approximately 33 percent, well above the European average of only 19 percent (Bank of Italy, 2013, p. 5). The second subsample covers all other (larger) firms. Notice that we exclude firms with missing data for the key variables.

Finally, in our estimates potential omitted variables bias can be addressed through the use of instruments for family managers' gender. Indeed, we require an instrumental-variable that can predict gender of family managers, without directly affecting the probability that these family managers receive variable earning schemes. As suggested by Lazear (2004), managers may be endowed with a set of general skills, and tertiary education offers more generalist abilities than upper secondary education (which is more specialised in providing vocational training). Then we employ as instrument for the share of women who run the firm, the share of women with tertiary education at the provincial level in 2001, calculated on the basis of Census data. The rationale behind this choice is that the educational endowments of the female population found in local markets in 2001 persist over time and are positively associated with the educational levels and thus with the share of female managers operating in the same geographical area in 2010. In other words, a large share of women who are graduates in a given province in 2001 implies a high probability of finding a high fraction of women who manage firms within the same province ten years later. Conversely, it is unlikely that the provincial share of women with tertiary education in 2001 is strongly correlated with the incidence of variable earning of managers in the same area in 2010.

Detailed definitions of variables are reported in Table A1.

### **3.2 Descriptive statistics**

Table 1 reports the means and standard deviations of selected variables. Concerning personal characteristics of family management (gender, age and education) we find that only 14 per cent of firms have female top management, and that Italian family firms have on average 12 percent of prime-age managers (i.e. managers aged between 18 and 40 years), whereas the most representative group is between 39 and 60 (around 60 per cent), followed by the group of senior management (aged more than 59). Concerning education, we observe that twenty per cent of managers has a tertiary degree of education, whereas the proportions of managers with at most secondary or primary education stand at around 55 and 25 percent, respectively. On average, 37 per cent of top managers receive a reward at least partially linked to firm performance. These summary indicators, taken as whole, thus indicate that male and middle age management, with at most a secondary degree of education, is the most representative group of executives who run the Italian family firms.

A useful comparison of personal characteristics of managers and their subordinates are offered by data on gender and educational composition of the labour force. We find that the share of female employees is higher; the class of employees with at most primary education is the highest group and represents nearly around one half of the whole labour force, whereas only 7% of employees has a tertiary level of education. Table 1 also shows that the share of trained workers is around only one fifth of total employees and that the share of workers with fixed-term contracts represents 14% of the total workforce in 2010. Data on performance related pay schemes offered to employees shows the limited diffusion of these schemes, that are present only in 4 % of surveyed firms in 2010.

The sectoral distribution of firms records its highest value for manufacturing firms (29%), followed by Retail and Wholesale Trade firms (23%). Additional characteristics offer a profile of the majority of Italian enterprises not involved in



R&D (only 10% of firms had undertaken R&D), not exposed to international trade (only 23% were exporters), and not belonging, in the vast majority of cases (97%), to a national or multinational group. This latter trait is in conformity with the dimensional portrait of Italian family firms: even excluding firms with fewer than 5 employees, the majority of sampled firms (nearly 79%) employs less than 15 employees.

#### 4. Econometric Analysis

##### 4.1 The econometric strategy

Our research question concerns the role of gender of family management in the structure of managerial compensation packages, i.e. in the probability that these packages include variable payments linked to performance (cash and/or equity bonuses).

Thus, we begin our econometric analysis by estimating different specifications of the following equation:

$$(1) \quad VC_i = \alpha \cdot Female + \beta \cdot X_i + \delta \cdot Y_i + \varepsilon_i$$

where the dependent variable  $VE_i$  is the payment of a variable earning scheme of any type by firm  $i$ , to his top family managers,  $Female$  is a dummy variable that assumes the value equal to 1 if the top manager is a woman and 0 otherwise.  $X_i$  is a vector that describes the composition of the workforce,  $Y_i$  is a vector of other firm and workplace characteristics (for details, see Table A1 in the Appendix) and  $\varepsilon_i$  is an idiosyncratic error term.

As our dependent variable is either zero or one, we estimate its determinants with probit regressions which fit a cumulative normal distribution. We thus estimate a nonlinear Probit specification of equation (1) to account for the dichotomous nature of the  $VE$  variable (Wooldrige, 2001).

Potential problems with this empirical strategy, however, concern firms' unobserved heterogeneity and endogeneity issues. In particular, if there are unobservable factors that influence both the share of female managers and the presence of  $VE$  schemes at the firm level, our Probit estimates might suffer from omitted variables bias. For example, female family managers may be likely to concentrate in firms where only fixed salary are paid, rather than variable earning, or they may run firms characterised by low-quality practices and industrial relations, characteristics that might be likely to be associated with the limited use of  $VE$ . In such circumstances, negative estimates of the association between female managers' and the use of variable compensation (hereafter denoted as  $VE$ ) may partially reflect unobserved firm heterogeneity rather than gender and behavioural traits associated with the sex of managers. To minimise these biases, we estimate different specifications of equation (1) by including a large set of variables that capture important observable and unobservable characteristics of firms, managers and workers.

Furthermore, potential omitted variables bias can be addressed through the use of instruments for the share of female managers. Thus, we require instrumental-variables that can predict the probability of having a female managers, without directly affecting the probability of  $VE$ . As said above, we employ as

instrument for the share of women who own and run the firm, the share of women with tertiary education at the provincial level in 2001, calculated on the basis of Census data.

Finally, as additional robustness checks, we also performed estimates for two smaller sub-sample of firms: i) with less than 10 employees, and ii) with more than 10 employees. The choice of the threshold of 10 employees permits to include or exclude all micro- firms, according to the classification adopted by EUROSTAT. These firms, that in Italy represents 19% of the total number of enterprises in industry and services and are responsible for employing more than 23% of workers, are particularly common in services and are more oriented to the regional market (ISTAT, 2013), thus they may be characterized by compensation systems that are different from those adopted by other, larger firms.

## 4.2. Probit estimates

The findings for our *VE* estimates, reported in Table 2, indicate that the presence of female family management, the dummy variable *Female*, is significantly and negatively associated with the probability of adopting *VE*, compared to the presence of male family management (the omitted category). These results are obtained, first, with the most parsimonious specification, where we control for managers' age and education and a few number of firm' s characteristics (ownership and size, firm's associations with other business units and geographical location (Model 1). Secondly, these results are also supported by specifications in which additional covariates for firm characteristics (Model 2) and workforce characteristics (Model 3) are added. Similarly, in estimations of Model 1 and 2 the coefficient for the dummy variable *Female* is 5.1% and 5.6%. However, the estimated coefficient is even larger (-7.6%) when we control for all data on firm and workforce characteristics, obtainable from our database (Model 3). In sum, controlling for a wider set of covariates (Model 3), we obtain a gender gap in structure of compensation packages: female family managers receive with a lower probability their rewards in the form of variable cash bonuses, equity compensations and stock options than do men

For control variables a thorough analysis will be proposed below, when we present IV estimation that corrects for heterogeneities and endogeneity biases. In any case, for Probit estimates, we limit to observe the following results (last specification, Model 3 of Table 2): more educated managers, operating in larger no-family firms, best performing in terms of Return of Sales (In Ros) and mainly localised in Northern regions, are less prone than their counterparts to be paid by *VE* schemes. We also obtain that firms characterised by staff in higher positions (executives and white collars), who hire less precarious workers (that is, with relatively few fixed-term contracts) and with a large male workforce component show a minor propensity to compensate their managers with variable pay schemes.

[Table 2 about here]

### 4.2.2 IV Probit Results

In all specifications presented so far the coefficient for the female dummy variable is statistically significant but relatively small in magnitude, within the range of 5.1%-7.6%. However, as noted above, the Probit estimates are subject to

potential biases, due to possible unobserved heterogeneities and omitted variables. To mitigate these effects, we employ IV estimations. The second-stage IV Probit estimates, performed for the most complete model that includes all controls, offer validation of our main hypothesis: the presence of female family management is negatively associated with the use of incentive policies (*VE*), and the magnitude of this impact is higher than in previous estimates, so that, controlling for endogeneity clearly increases the measured impact of gender on adoption of *VE*: the coefficient for this variable is much higher (48%), and significant at the 1% level (Table 3). This result confirms that our instrumental variables help reduce the downward bias due to measurement errors (Griliches & Hausman, 1986). The validity of our strategy is given by the coefficient obtained for our external instrument (described above) that shows the expected sign and is significant at the 1% level (column b, Table 3). The validity of the instrument is also confirmed by the standard identification tests (see last rows of Table 3).

Our main result obtained from Probit estimates is confirmed by IV Probit results: from Table 3, one can observe that when human capital variables, composition of occupation and firm characteristics are controlled for (Model 3), approximately 48% of the adoption of contingent schemes to reward top executives is explained by gender different propensities for these schemes. Thus, also IV Probit estimates confirm that the probability that managers are compensated with contingent rewards is lower for the female component.

For most of our control variables, the IV Probit estimates confirm our previous Probit results, although some changes relate to education and age of top management (not significant in the IV estimates).

#### *Controls*

##### *Managers' characteristics*

We first control for human capital and demographic attributes of management because one can expect that part of the gender gap in pay structure could be explained by these factors, rather than gender identity. For example, gender could have an influence on pay structure not because female managers are different from men, but because the group of female management in our sample differs from the group of male management in terms of some characteristics, such as human capital and age, potentially correlated with our dependent variable, rather than with gender attributes. Thus, we first control for an observable such as education, as education is acknowledged to be one of the most important components of general human capital and also captures the role of a multidimensional set of observable and unobservable skills that are relevant in the choice of practices in human resource management, such as incentive systems (Damiani and Ricci, 2014). In addition, we introduce age, an attribute that may be correlated with individual features such as risk aversion and professional experience, under the hypothesis that returns to age and experience are potential determinants of managerial compensation and pay structure (Vieito and Khan, 2012; Kulich et al. 2011). Our IV results clearly show that the parameter estimate of the gender dummy *Female* is statistically significant controlling for different levels of education and classes of age (primary education and ages lower than 39 the omitted categories), thus suggesting that the phenomenon of the gender gap in pay structure is not merely driven by these attributes. Notice also that in contrast with Probit estimates, education and age lost their significance in IV Probit estimates.

In sum, controlling for managers' characteristics, from our results it might be argued that inherent differences by sex in risk aversion, exposure to competition

and expected tenure are likely determinants of adoption of *VE*. Indeed, if women are more risk averse and have shorter expected tenure than men, they consequently are less likely than men in schemes that include payment by results, especially in forms of deferred compensation such as stock options and equity compensation (Goldin, 1986; Heywood and Jirjahn, 2002). Thus, as in Manning and Saidi (2010), we may use the presence of a variable earning scheme as an indicator of a more competitive workplace and gender differences in the form of pay as a reflection of differentials in preferences in terms of competitiveness, motivation and ambition, although we interpret our results with caution, because our variables do not reflect all measures of differences in risk preferences, attitudes towards competition, and social preferences that laboratory experiments have found to be relevant.

#### *Firm characteristics*

The role of size is another important control, as shown by Bertrand and Hallock (2001). If women in top managerial positions are less present in much smaller firms than men, a significant negative coefficient associated of *VE* with the female dummy variable could only reflect the lower attitude of small firms to adopt contingent rather than fixed rewards. However, our IV regression, that controls for size, shows the negative role of female leadership and offers confirmation that gender gap in pay structure cannot be attributed only to a dimensional effect. Notice that concerning adoption of *VE* payments, the expected role of size is not clear cut since the compensation literature suggests two opposite effects. On one hand, asymmetric information and monitoring costs increase with firm size and explain the positive correlation of size with *VE* schemes. Furthermore, larger firms can more easily afford costly strategies such as the upgrading of management through implementation of *VE* schemes, also because economies of scale reduce implementation costs of these schemes and explain why benefits of these payments are likely to exceed costs. On the other hand, opportunistic behaviour and free-riding arguments are more frequent in large firms (where managers may extract benefits in the form of cash bonuses and stock options) thus generating an opposite, negative correlation. For instance, Jensen and Murphy (1990) showed that CEOs of large companies were paid like bureaucrats and that their pay packages showed very little variability, so that they received small rewards for superior performance but even smaller penalties for failures.

In our case the negative effect prevails: estimates, reported in Table 3, show that the probability of *VE* is negatively correlated with company size, variable bonuses paid to management being less frequent in large firms.

An additional widely debated issue in gender literature is horizontal segregation, because women are not uniformly represented in all industries, but rather concentrated in some specific industries, such as the social sector (Azmat and Petrongolo, 2014).

Thus, a negative spurious correlation between the female top manager variable (*Female*) and *VE* may be obtained only because women more likely manage firms operating in specific sectors, such as social services and health, that are also sectors where variable pay schemes are less likely adopted, whereas women are less present in finance, where *VE* schemes are more frequently implemented. However, also controlling for sectors, we obtain the negative effects of the

*Female* dummy variable, suggesting that industrial segregation of female executives does not account all gap in compensation structure.

The presence of a significant gap in pay structure is confirmed controlling for ownership structure and thus including a dummy variable equals to one to indicate whether a firm is owned and or/controlled by a family and 0 otherwise. The hypothesis behind this inclusion is that the separation between ownership and control may significantly influence a firm's choice of strategy, including incentives (see among others the overview of Shleifer and Vishny, 1997 and the research paper of Chen et al. 2014). It is argued that ownership concentration in the hand of families makes it easier to align the interests of the owners in family businesses than in nonfamily ones (Vilaseca, 2002). Indeed, family CEOs in family controlled firms have less conflicts of interest, less information asymmetry and less self interest with respect to firms not owned nor controlled by families. Thus, top managers set themselves a low component of contingent pay in family owned firms, (compared to the CEOs of other firms), as found by Carrasco-Hernandez, Sánchez-Marín (2007) and Chen et al. 2014. Unexpectedly, and in contrast with these studies, we obtain that in Italian firms the probability of adoption of payment by results is higher under family ownership and control. Two explanations may be offered.

The first explanation is that Agency Problem of type II is particularly severe in the Italian economy, and *VE* schemes are potential devices to overcome the disalignment of interests of major and minority owners or other stakeholders. Indeed, as discussed in section 2, in family firms a second type of conflict appears (Agency problem II), because the large owner or shareholder has greater incentives for expropriation and another conflict of interests arises, between the controlling owner (a family or individual) and minority owners or other stakeholders (Claessens et al., 2000, Villalonga and Amit, 2006). Therefore, also in such a firm, variable pays, such as equity-based compensation, might contribute to the alleviation of agency problems of type II, that might reveal even more severe than that featuring the Agency problem of type I.

A second explanation is that *VE* may simply mask appropriation of private benefits, in line with the *camouflage* theory (Bebchuk and Fried, 2003) according to which payments by results is an attempt to legitimize and obscure excessive management rewards and conceal appropriation of private benefits. Thus, in our case study it might be that under family control, *VE* are likely adopted to minimize the outrage costs that family firms have to pay whenever stakeholders and firm outsiders recognize the presence of rent extraction.

Both explanations may concur to explain the positive coefficient associated of our dependent variable *VE* with the dummy variable for family firms.

As additional control, we take into account whether the firm is a unit of a national, local, or multinational group (the omitted category). Also inserting this control, our results clearly lead to reject the hypotheses that gender differentials are merely driven by not uniform distribution of women across different types of firms; in addition we obtain that the probability of *VE* is higher for firms owned and controlled by families but that belong to large multinational groups. One hypothesis behind these results is that when the firm is a part of a larger group, fixed costs to adopt *VE* may be spread across establishments within the group. Furthermore, *VE* may be adopted in firms that belong to an international group because these companies face different sets of incentives and *VE* may be an useful device to overcome the attitude of Italian family firms, that are otherwise "typically reluctant to partly decentralise governance in order to manage complex

operations spread in several countries”, as signaled by Barba Navaretti et al. (2008, p. 3).

We have an additional control for *Return on sales for employees*. This variable has been introduced to have a confirmation of the role of the gender dummy *Female* and to exclude the hypothesis that its significance is only the result of a heterogeneous presence of female management in companies with different performances. Notice also that for performance, two different hypotheses are conceivable. First, variable bonuses are supposedly offered to reward managers for achieved performance and thus they are concession agreements, mainly adopted in those firms with greater ‘ability to pay’. In such a case we expect a positive coefficient. Second, variable bonuses are paid to top management likely to counterbalance negative results and are thus adopted for their potential role of enhancing motivation and commitment (thus expecting a negative coefficient). According to our results, the second hypothesis seems to be prevalent for Italian firms; in any case when we control for performance we verify that observed differentials by gender of pay structure do not simply reflect the fact that women manage firms performing well or not.

Finally, we control for age of firms, their R&D expenses and their presence in international markets as exporters. According to IV Probit estimates, the negative significant coefficient for the latter variable signals that in exporting firms management have lower propensity to be paid with *VE* schemes. It appears as an unexpected result because exposure to international competition may stimulate the use of variable pay to provide incentives to top management to enhance their efficient leadership (Drago and Heywood 1995). However, this hypothesis is not verified for the Italian economy because, as said, our IV results show a significant negative association between firms’ presence in international markets and *VE*. This unexpected result may be simply associated to unobservable characteristics of exporting Italian firms, mainly operating in traditional and low-tech sectors that use inferior technology. Thus, for firms operating in such sectors it is conceivable that personnel practices tend to not involve *VE* and therefore there may be an indirect link between respective establishment characteristics and *VE* practices, partially reflecting firm-specific technological factors. IV estimates help resolve, at least partially, this bias, which is also mitigated by including industry dummies that capture sector-specific technological factors.

#### *Workers’ characteristics*

Additional controls for workforce composition are included. Interestingly, there is a strong confirmation that those establishments with large shares of fixed-term contracts, blue collars and female workers were more likely than others to use payment by results for their top management. Interestingly, *VE* schemes paid to family management are thus a distinctive feature of those firms that adopt low performance workplace practices. These firms are less willing than others to invest in long-run industrial relations, recruit workers for less qualified positions and have a large share of peripheral workforce (such as female employees, with shorter expected tenure and who traditionally prefer jobs that allow for greater flexibility between job and family, Zwick, 2004). In sum, the higher probability of contingent rewards for top management in companies that adopt inferior workplace practices might be coherent with the hypothesis that, at least in our case study, variable cash bonuses and equity compensation is also a manifestation of agency problem (rather than a solution of this problem), so that *VE* frequently reflect managers’ ability to extract rents, in conformity with the *managerial power approach* (Bebchuk and Fried, 2003). In any case, what is more relevant for our

analysis is that the significant negative coefficient of our dummy variable *Female* obtained controlling for workers' characteristics, is not driven by association of female management and different patterns of workplace practices. Other robustness checks are presented below.

### **Robustness checks**

Our Probit and IV Probit estimates are repeated for two different sub-samples that include only micro-firms (firms with less than 10, according to the EUROSTAT definition) and firms with more than 10 employees. For both subsamples, we adopt the specification that include all controls (Model 3). Probit results confirm the significant negative coefficient for the gender dummy variable *Female* for both sub-samples and a greater coefficient for micro-firms.

Also for these two subsamples we adopt the same econometric strategy already presented for the whole sample and thus we carried out instrumental variable estimates. With this strategy we take into account omitted variables biases and endogeneity issues, due to the fact that firms that adopt *VE* may attract a lower share of female management. The IV Probit estimates, performed for the most comprehensive specification (Model 3), permit to verify that our key regressor is exogenous and confirm that particularly for micro-firms the share of female top managers is a significant determinant that negatively influences the adoption of variable earnings.

### **5. Conclusions**

Laboratory experiments and analyses based on economic models of identity and work incentives have shown that the unexplained gender pay gap is not only attributable to human capital and sector segregation, or merely caused by sex discrimination, but also by unobservable differences, such as sex heterogeneities in preferences and lower long-term career commitment among women and men. However, most studies have documented these gender disparities on the general population, on students or workers in subordinate positions, but only few studies have focused on gender compensation differentials among top executives. Notice also that gender disparities might be minimized in the group of top executives, because women and men who climb the corporate ladder and reach the top of the firm hierarchy may share similar preferences, such as high career ambition and risk preferences, irrespective on their gender identity. Thus, it has been argued that if women must be like men to break the 'glass ceiling', it is likely that differences fade away at the high level of corporate hierarchy (Adams and Funk, 2012).

So far, these claims have been tested (and refuted) only in a limited number of studies focused on women at the top of the corporate ladder and mainly restricted to gender disparities in relative compensation (Bertrand and Hallock, 2001) or value priorities and risk attitudes (Adams and Funk, 2012), whereas only limited attention has been paid to the structure of managerial compensation packages.

This paper highlights this dimension and considers not the *level* but the *form* of pay, thus estimating gender differences in pay structure. Notice also that previous research has shown that a large share of differences in pay levels between women and men are explained by the higher representation of women in lower-paying occupations and lower-paying firms within occupations (Chauvin and Ash, 1994; Bertrand and Hallock, 2001). In our analysis we considered a fairly homogenous group, represented by family top executives who run the firm, so that a gap in

compensation structure between women and men might be more convincingly explained by differences in motivation and preferences. Furthermore, by focusing on family managers in leadership position, and thus with a great bargaining power in setting their rewards, gender disparities are less likely related to sex discrimination, but are more linked to identity and commitment. Finally, the introduction in our estimates of a large set of controls for firm characteristics has permitted to identify the conditional gender gap that is not attributable to the under-representation of women in firms that offer less frequently contingent earnings. Similarly, controlling for sectors, has permitted to unveil evidence of sex disparities not accounted by sectoral segregation.

From our data set, that covers a wide cross-section of firms, we obtain some interesting results. The gender pay differential manifests in the form of pay and when controlling for firm and workforce attributes we still find significant negative effects of women at the top in firm hierarchy. These results seem to suggest that in Italian firms women in leadership position opt more frequently for fixed salary than do men, in conformity with the hypotheses advanced in recent gender literature, that they dislike competition, are more risk averse and less self-confident than their men colleagues. Furthermore, women shorter expected tenure with respect than that featuring their male counterparts may explain why women are less motivated by deferred compensation such as stock options and equity compensation.

Summing up, we use the presence of a variable earning scheme as an indicator of a more competitive workplace, as in Manning and Saidi (2010), and we suggest that lower representation of women in variable earning schemes might signal their minor attitudes toward competition. However, we interpret our results with caution, because our variables do not reflect all measures of differences in attitudes towards competition and related personal traits (risk aversion and social preferences) that laboratory experiments have found to be relevant. Additional research aimed at investigating these issues on the basis of a richer database that includes details on personal motivations, family status and individual responsibility for household tasks may contribute to a further study of the gender pay gap.



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**Table 1: Descriptive statistics**

	Mean	St. dev.	Min.	Max.
<b>Managers' characteristics</b>				
Variable Earnings ( <i>VE</i> )	0.39	0.49	0	1
Female Entrepreneurs	0.14	0.35	0	1
Tertiary education	0.20	0.40	0	1
Upper secondary education	0.55	0.50	0	1
Primary and lower second. education	0.25	0.43	0	1
age>59	0.27	0.44	0	1
39 <age<60	0.60	0.49	0	1
18 <age <40	0.13	0.34	0	1
<b>Firm ownership and control</b>				
Family firm	0.96	0.19	0	1
International Group	0.01	0.08	0	1
National Group	0.05	0.21	0	1
No group	0.95	0.22	0	1
<b>Workforce characteristics</b>				
% tertiary education	0.07	0.16	0	1
% upper secondary education	0.45	0.32	0	1
% lower secondary education	0.48	0.35	0	1
% executives	0.03	0.10	0	1
% white collars	0.35	0.32	0	1
% blue collars	0.62	0.34	0	1
% females	0.38	0.31	0	1
% trained	0.17	0.32	0	1
% fixed term contracts	0.14	0.22	0	1
<b>Other Firm characteristics</b>				
Ln (Ros per employee)	11.63	1.18	3.14	19.50
Performance related pay	0.04	0.19	0	1
Firm age	19.49	15.78	0	814
R&D	0.10	0.30	0	1
Foreign market	0.21	0.41	0	1
5 < n. employees < 15	0.83	0.37	0	1
14 < n. employees < 50	0.14	0.35	0	1
49 < n. employees < 250	0.03	0.16	0	1
N. employees > 249	0.00	0.05	0	1
North West	0.30	0.46	0	1
North East	0.25	0.43	0	1
Centre	0.22	0.41	0	1
South	0.23	0.42	0	1
Quarrying, Mining etc	0.00	0.05	0	1
Manufacturing	0.28	0.45	0	1
Electricity, water and gas distribution	0.01	0.09	0	1
Construction	0.15	0.35	0	1
Retail and wholesale	0.24	0.43	0	1
Transportation	0.03	0.18	0	1
Hotels and restaurants	0.11	0.31	0	1
Intermediation, real estate and rental	0.05	0.22	0	1
Information, comm.. and others	0.08	0.27	0	1
Health, education and social services	0.02	0.14	0	1
Sports, entertainment and other	0.03	0.16	0	1
<b>N. of Observations</b>	<b>9636</b>			

**Table 2: Probit estimates of family managers Variable Earnings (VE) marginal effects**

	Model 1		Model 2		Model 3	
	dy/dx	std err	dy/dx	std err	dy/dx	std err
<b>Managers' characteristics</b>						
Female	-0.051 ***	0.012	-0.056 ***	0.012	-0.076 ***	0.014
Tertiary education	-0.090 ***	0.014	-0.075 ***	0.014	-0.040 ***	0.015
Upper secondary education	-0.064 ***	0.010	-0.055 ***	0.010	-0.040 ***	0.011
age>59	0.048 ***	0.014	0.066 ***	0.014	0.081 ***	0.016
39 <age<60	0.044 ***	0.014	0.054 ***	0.015	0.058 ***	0.016
<b>Firm ownership and control</b>						
Family firm	0.171 ***	0.023	0.152 ***	0.023	0.171 ***	0.026
National group	-0.098 **	0.049	-0.086 *	0.051	-0.112 *	0.062
No group	-0.090 **	0.044	-0.080 *	0.046	-0.131 **	0.057
<b>Workforce characteristics</b>						
% tertiary education					-0.049	0.038
% upper secondary education					-0.003	0.019
% executives					-0.414 ***	0.060
% white collars					-0.146 ***	0.027
% females					0.128 ***	0.020
% trained					0.012	0.014
% fixed term contracts					0.078 ***	0.025
<b>Other firm characteristics</b>						
ln(Ros per employee)			-0.022 ***	0.003	-0.016 ***	0.004
Performance related pay			0.015	0.018	0.009	0.020
Firm age			-0.001 ***	0.000	0.000 **	0.000
R&D			-0.028 **	0.013	-0.016	0.015
Foreign market			-0.054 ***	0.010	-0.055 ***	0.012
14 < n. employees < 50	-0.154 ***	0.010	-0.149 ***	0.010	-0.155 ***	0.011
49 < n. employees < 250	-0.209 ***	0.016	-0.186 ***	0.016	-0.194 ***	0.022
n. employees > 249	-0.150 ***	0.035	-0.129 ***	0.035	-0.118 ***	0.044
North East	-0.001	0.020	-0.003	0.020	-0.009 ***	0.019
Centre	-0.024	0.020	-0.027	0.021	-0.027 ***	0.021
South	0.035 *	0.021	0.023	0.022	0.024 ***	0.020
Sectors		yes		yes		yes
Wald chi2		1232.05		1859.09		2270.78
Prob > chi2		0.000		0.000		0.000
Pseudo R2		0.061		0.066		0.076
<b>N. of observations</b>		12504		11897		9636

Notes: Omitted variables: managers with lower secondary and primary education and age <40 %. workers with lower secondary and primary education. South; n. of employees <15, International groups. Robust standard errors; statistical significance \*\*\* at 1%. \*\* at 5%. \* at 10%.

**Table 3: IV Probit estimates of family managers Variable Earnings (VE)**

	Second stage		First stage		
	dy/dx	St. err.	coef	St. err.	
<b>Managers' characteristics</b>					
Female	-0.481	**	0.231		
Tertiary education	-0.021		0.019	0.030	***
Upper secondary education	-0.013		0.021	0.049	***
age>59	0.043		0.030	-0.069	***
39 <age<60	0.040	*	0.022	-0.027	**
<b>Firm ownership and control</b>					
Family firm	0.158	***	0.030	0.018	
National group	-0.096	*	0.053	0.009	
No group	-0.108	**	0.053	0.020	
<b>Workforce characteristics</b>					
% executives	-0.343	***	0.080	0.042	
% white collars	-0.158	***	0.028	-0.080	***
% tertiary education	-0.019		0.046	0.056	
% upper secondary education	-0.011		0.017	-0.019	
% females	0.183	***	0.031	0.172	***
% trained	0.023		0.015	0.029	***
% fixed term contracts	0.082	***	0.024	0.035	
<b>Other firm characteristics</b>					
ln (Ros per employee)	-0.019	***	0.004	-0.012	***
Performance related pay	0.016		0.020	0.019	
Firm age	0.000	**	0.000	0.000	
R&D	-0.014		0.015	0.002	
Foreign market	-0.051	***	0.014	-0.004	
14< n. employees<50	-0.142	***	0.023	-0.014	
49< n. employees<250	-0.189	***	0.026	-0.045	***
N. employees>249	-0.128	***	0.039	-0.063	**
North East	-0.016		0.018	-0.015	*
Centre	-0.024		0.019	-0.018	**
South	0.022		0.019	0.004	
Sectors		Yes			Yes
% local tertiary education					
1971			2,117	***	0.342
Constant			0.195	***	0.060
Athrho			0.444		0.306
Lnsigma			-1,107	***	0.017
Rho			0.417		0.252
Sigma			0.330		0.006
<b>Wald test of exogeneity</b>					
chi2			2.11		
Prob>chi2			0.1459		
Wald chi2			3108.32		
Prob > chi2			0.000		
N. of observations			9636		

Notes: Omitted variables: managers with lower secondary and primary education and age <40 %. workers with lower secondary and primary education. South; n. of employees<15, International groups. Robust standard errors; statistical significance \*\*\* at 1%. \*\* at 5%. \* at 10%.



**Table 4: Probit estimates of family managers Variable Earnings (VE): subsamples of firms under 10 employees and more than 10 employees**

	<b>under 10 employees</b>		<b>more than 10 employees</b>	
	dy/dx	std err	dy/dx	std err
<b>Managers' characteristics</b>				
Female	-0.083 ***	0.020	-0.063 ***	0.019
Tertiary education	-0.048 **	0.021	-0.043 **	0.017
Upper secondary education	-0.018	0.016	-0.065 ***	0.015
age>59	0.073 ***	0.025	0.088 ***	0.022
39 <age<60	0.066 ***	0.020	0.050 **	0.024
Family firm	0.225 ***	0.044	0.142 ***	0.027
National group	-0.151	0.126	-0.076	0.069
No group	-0.148	0.114	-0.082	0.064
<b>Workforce characteristics</b>				
% tertiary education	-0.046	0.048	-0.030	0.056
% upper secondary education	-0.011	0.025	0.009	0.028
% executives	-0.480 ***	0.078	-0.363 ***	0.112
% white collars	-0.206 ***	0.038	-0.079 **	0.036
% females	0.190 ***	0.030	0.061 *	0.032
% trained	0.019	0.020	0.009	0.018
% fixed term contracts	0.115 ***	0.038	0.016	0.031
<b>Firms' characteristics</b>				
ln(Ros per employee)	-0.012 *	0.006	-0.018 ***	0.005
Performance related pay	0.075 *	0.039	-0.021	0.022
Firm age	0.001	0.001	-0.001 ***	0.000
R&D	-0.021	0.031	-0.025	0.017
foreign market	-0.086 ***	0.022	-0.037 **	0.017
North East	-0.029	0.027	0.006	0.019
Centre	-0.026	0.031	-0.030	0.021
South	0.038	0.028	0.007	0.019
sectors		yes		yes
Wald chi2		535.68		428.21
Prob > chi2		0.000		0.000
Pseudo R2		0.054		0.046
N. of observations		4698		4938

Notes: Omitted variables: managers with lower secondary and primary education and age <40 %. workers with lower secondary and primary education. South; n. of employees<15, International groups. Robust standard errors; statistical significance \*\*\* at 1%. \*\* at 5%. \* at 10%.

**Table 5: IV Probit estimates of family managers Variable Earnings (VE) subsamples of firms under 10 employees and more than 10 employees**

	under 10 employees					over 10 employees						
	second stage		first stage			second stage		frist stage				
	dy/dx	st er	coef	st er	coef	dy/dx	st er	coef	st er			
<b>Managers' characteristics</b>												
Female	-0.539	**	0.215			-0.271		0.394				
Tertiary education	-0.020		0.027	0.035	**	0.018	-0.036	0.023	0.025	*	0.013	
Upper secondary education	0.007		0.021	0.042	***	0.013	-0.051	*	0.031	0.055	***	0.011
age>59	0.017		0.040	-0.092	***	0.019	0.076	**	0.034	-0.045	**	0.019
39 <age<60	0.035		0.028	-0.041	**	0.017	0.047	*	0.026	-0.009		0.016
<b>Firm ownership and control</b>												
family firm	0.187	***	0.051	0.006		0.029	0.144	***	0.026	0.023	*	0.013
National Group	-0.176		0.119	-0.114		0.086	-0.060		0.069	0.067	***	0.016
No group	-0.165		0.108	-0.093		0.084	-0.064		0.071	0.082	***	0.012
<b>Workforce characteristics</b>												
% executives	-0.368	***	0.113	0.041		0.060	-0.341	***	0.102	0.060		0.072
% white collars	-0.214	***	0.038	-0.105	***	0.027	-0.083	**	0.034	-0.031		0.027
% tertiary education	0.005		0.051	0.086	***	0.033	-0.035		0.061	-0.022		0.055
% upper secondary education	-0.009		0.023	0.000		0.021	-0.001		0.034	-0.046	**	0.018
% females	0.250	***	0.031	0.205	***	0.024	0.086		0.055	0.129	***	0.028
% trained	0.026		0.018	0.023	*	0.014	0.016		0.025	0.031	**	0.015
% fixed term contracts	0.094	**	0.043	0.005		0.033	0.031		0.047	0.073	**	0.034
<b>Other firm characteristics</b>												
ln(Ros per employee)	-0.021	***	0.007	-0.024	***	0.005	-0.018	***	0.005	-0.003		0.004
performance related pay	0.075	**	0.037	0.032		0.031	-0.019		0.024	0.006		0.014
Firm age	0.000		0.001	-0.001		0.000	-0.001	***	0.000	0.000		0.000
R&D	-0.017		0.028	0.001		0.019	-0.025		0.016	-0.003		0.012
Foreign market	-0.066	**	0.027	0.010		0.015	-0.039		0.017	-0.015		0.013
North East	-0.035		0.025	-0.016		0.015	0.002		0.022	-0.012		0.010
Centre	-0.027		0.025	-0.033		0.015	-0.027		0.022	-0.002		0.011
South	0.037		0.024	0.014		0.016	0.006		0.020	-0.007		0.011
Sectors		yes			yes			yes			yes	
% local tert.educ.1971				2.773	***	0.466				1.328	***	0.510
constant				0.470	***	0.123				0.023		0.070
athrho				0.515		0.330				0.220		0.432
lnsigma				-1.066	***	0.019				-1.157	***	0.020
rho				0.474		0.256				0.217		0.411
sigma				0.344		0.007				0.314		0.006
<b>Wald test of exogeneity</b>												
chi2						2.43						0.26
Prob>chi2						0.119						0.610
Wald chi2				639.73					492.79			
Prob > chi2				0.000					0.000			
N. of observations				4698					4938			

Notes: Omitted variables: managers with lower secondary and primary education and age <40 %. workers with lower secondary and primary education. South; n. of employees<15, International groups. Robust standard errors; statistical significance \*\*\* at 1%. \*\* at 5%. \* at 10%.

**Table A1: Variable definitions**

<b>Managers' gender</b>	
Female	A dummy variable that equals 1 if the entrepreneur is a female and 0 otherwise
<b>Education of managers and workforce</b>	
Tertiary education	A dummy variable that equals 1 if the manager of the firm has a tertiary education (post-secondary education) and 0 otherwise
Upper Secondary education	A dummy variable that equals 1 if the manager of the firm has an upper secondary education and 0 otherwise
Lower Secondary and Primary education	A dummy variable that equals 1 if the manager of the firm has a lower and primary education and 0 otherwise
<b>AGE</b> 18<age<40 39<age<60 age>59	Classes of the age of the manager of the firm Between 18-40 Between 39-60 Over 59
<b>Firm ownership and control</b>	
Family firm	A dummy variable that equals 1 if the firm is run by family owners and 0 otherwise
National group	A dummy variable that equals 1 if the firm belongs to a national
International group	A dummy variable that equals 1 if the firm belongs to an international group
No group	A dummy variable that equals 1 if the firm does not belong to any group
<b>Other firm characteristics</b>	
Firm Size	The total number of employees divided in four classes by size
Performance related pay	A dummy variable that equals 1 if the firm adopts for its workforce a payment by results of any type and 0 otherwise
Foreign market	A dummy variable that equals 1 if the firm is an exporter and 0 otherwise.
Ln (Ros)	The percentage return on sales. operating profits/total sales (ln transformation)
Firm age	The age of firms
R&D	A dummy variable that equals 1 if the firm undertook R&D and 0 otherwise
<b>Workforce characteristics</b>	
% Fixed-term contracts	The percentage of fixed-term employees
% Training	The percentage of total employees trained
% Females	The percentage of women relative to the total number of employees
Immigrants	Share of immigrant employees
<b>Geographical location</b>	
North-West	A dummy variable that equals 1 if the firm is localized in Italy's North-Western regions and 0 otherwise
North-East	A dummy variable that equals 1 if the firm is localized in Italy's North-Eastern regions and 0 otherwise
Centre	A dummy variable that equals 1 if the firm is localized in Italy's Central regions. and 0 otherwise
South	A dummy variable that equals 1 if the firm is localized in Italy's Southern regions and 0 otherwise
<b>Instrument</b>	
Share of graduates 2001	The province/sectoral share of women with a tertiary level of schooling relative to the total population. drawn from the Census data of 2001.