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MANAGERIAL TURNOVER AND WORKER TURNOVER *

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Abstract

We study the influence of the manager's degree of consolidation within the firm over the firm's labor policy. We argue that non-consolidated (recently-appointed) managers are more worried about short-term results than consolidated managers are. This feature leads the former to bias the labor contracting favoring short-term contracts. This has two main consequences. First, a higher variation in the number of workers hired in each period. And second, a lower increase in unitary labor costs. To contrast these results, we use a database of 1.054 Spanish companies during the period (1994-98), and analyze their managerial turnover as well as their corresponding variation in the number of workers and in unitary labor costs. The theoretical results are confirmed, especially for highly-productive (R&D-intensive) firms.

Keywords: Management, Turnover.

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1. INTRODUCTION

The role of the General Manager (´ GM) in a …rm has widely been studied in the business and economic literature (i.e., Galbraith, 1973, and Merz and Sauber, 1995). The academic interest on this subject rests on the pivotal role he/she has within the organization. One of the key decisions made by the GM, with a critical impact on the future of the organization, is the design of the …rm's investment policy. There are many factors that have a strong in‡uence on that decision, and one of particular relevance is the managers' consolidation degree, which determines the planning horizon of investment decisions. Non-consolidated managers have a weak position within the …rm and are pressured to obtain short-term results. Our paper is an attempt to analyze the e¤ects of the manager's consolidation, measured through managerial turnover, on one of the most important investment decisions of the …rm: the labor hiring policy.

The literature on managerial turnover has mainly focused on the factors that lead to a change in the GM, and less on its e¤ects. Results of this literature show that the decision to …re a manager is basically connected with three elements. First, the results he/she has obtained, second, the presence of some external elements, and third, his/her degree of consolidation within the …rm.

There exists a wide consensus on the importance of results as a performance measure to evaluate the GM and decide over his/her potential replacement. Audas et al. (1999) show the existence of a positive correlation between managerial turnover in English soccer teams and the (bad) results previous to the GM's replacement. Fizel and D'Itri (1997) obtain similar results for the US basketball college competition. Kahnna and Poulsen (1995) prove that managers are …red in situations of …nancial distress independently of the actions they have taken in the years previous to the period of distress. Other authors show that this relationship is not so strong: Hadlock and Lumer (1997) …nd out that managerial turnover from 1933 to 1941 was not sensible to changes in stock prices for small …rms. These authors suggest the existence of some external factors, which make managerial turnover only weakly related to either …rm's results or stock prices. Among the external factors that in‡uence management replacement, we …nd takeover activity, proxy …ghts and political factors. We should mention that, in some occasions, it is bad …rm's result that triggers a takeover and/or a proxy …ght, which generates, in turn, a managerial replacement. Thus, some of this external factors might also be related with …rm's result. With regard to takeover activity, Mikkelson and Partch (1997) compare the managerial turnover rate in

USA during 1984-88 (a period of high takeover activity) and 1989-93 (a period of low takeover activity). They show that the rate of turnover was higher during the …rst period than during the second one. Huang and Yen (1996) investigate the effect of proxy …ghts in Taiwanese …rms during 1984-91. They show the existence of a higher turnover rate in those situations where proxy …ghts are relevant. Finally, Jensen and Murphy (1990) argue that political factors might explain why the variation in stock prices is not much related to the GM's compensation scheme, especially in publicly-owned …rms. Political pressure to avoid high managerial rewards seems to have truncated the upper tail of the earning distribution. Thus, in equilibrium, the managers are "compensated" with some job security.

We abstract from the performance of the GM and the presence of external factors such as takeovers and consider the importance of the third element: the GM's consolidation degree. This factor is, to some extent, a synthesis of the previous ones. The results a manager obtains, jointly with the impact of external factors determine the degree of management consolidation. And, the higher the latter, the lower the managerial turnover. Thus, Fizel and Louie (1990), Dyl (1988) and Gómez Mejía et al. (1987) show that organizational performance does not a¤ect managerial turnover when managers are consolidated (i.e. they are members or chairs of the board of directors). But, apart from managerial turnover, the GM' degree of consolidation has other important e¤ects. Chevalier and Ellison (1999) analyze the GMs' behavior in the …nancial investment industry and conclude that "young" (less consolidated) GMs tend to be evaluated in a more severe way than "veteran" ones. This fact promotes the adoption of more conservatives strategies by less consolidated managers. Palley (1997) argues that those managers with a short-term contract, non-consolidated managers, have more incentives to be engaged in short-term projects. Within this setting, it seems natural to argue that non-consolidated managers may be biased to hire workers with a short-term contract for the same reasons for which they are biased to invest in short-term projects. This is, precisely, the main point of the paper. We try to investigate the e¤ects of the degree of management consolidation, proxied by managerial turnover, in the …rm's labor hiring policy. In particular, in the length of the labor contracts the GM proposes. This will also have e¤ects in labor costs as well as in the total number of the workers recruited.

We …rst develop a theoretical model of managerial and labor contracting. Managers o¤er workers a short-term contract (one-period length) or a long-term one (two-period length). In our model, long-term workers use part of their …rst-period working time improving their skills in some training activities. This decreases their productivity in the …rst period, but increases it in the second one. The point is that a non-consolidated manager has the perception that his/her continuity will depend on the short-term results he/she achieves, while a consolidated manager takes for granted his/her continuity. This feature leads the former manager, in comparison to the latter, to contract less long-term workers as they are more costly in the …rst period, although they generate higher returns in the second period. Thus, we expect a positive correlation between the degree of manager's consolidation and the contract length of newly hired workers.

Two direct consequences of this feature can be extracted. First, there is a higher worker turnover in …rms with a non-consolidated manager. And second, …rms with a non-consolidated manager will experience a lower variation in unitary labor costs. We argue that both consequences should be especially marked in those …rms with high workers' productivity, (i.e. R&D-intensive …rms, Clark and Griliches 1998), as in these …rms the consolidated-manager bias to contract long-term workers is especially high.

We test empirically this results. To do so, we analyze the managerial turnover rate in a database of 1.052 Spanish companies, and compare it with the corresponding variation in the number of workers and in unitary labor costs. We …nd out that the turnover rate has a positive correlation with the variation in the number of workers, and, a negative one with the variation in unitary labor costs. We also show, consistently with the theory, that the number of workers hired in highly-productive …rms is higher when a consolidated manager is in charge.

This paper is organized as follows. In Section 2 we outline the theoretical model. Section 3 describes the empirical analysis whose results are discussed in Section 4. The conclusions are stated in Section 5.

2. THE MODEL

Description:

We consider two agents: the manager and the workers. Our model comprises two periods. Initially, a manager wants to develop a two-period project, and hires in the labor market n^L long-term (´ LT) workers for two periods, and n_1^S short-term (´ ST) workers for one period. The balance of both magnitudes de…nes the proportion, s_1, of …rst-period ST workers. In the second period, if necessary, an amount of n_2^S of workers is hired. The relationship between n^L and n_2^S de…nes the proportion, s_2, of ST workers in the second period.

We distinguish two types of managers. On one hand, consolidated managers, who are not fired at the end of the first period independently of the firm's results. On the other hand, non-consolidated managers, who can be fired with an ex-ante probability that takes into consideration the firm's first-period outcome.

Assumptions

1/ LT workers devote a fraction of their working time to improve their expertise and become more productive in the second period. Their productivity in that period is augmented by a $K_2 > 1$ factor. As an outcome of the first-period training, however, LT workers' productivity during this period is lower than that of their ST counterparts. Accordingly, LT workers' productivity is diminished by a $K_1 < 1$ factor in the first period. Thus, assuming a constant returns to scale technology, the first-period production function is $Q_1 = (n_1^S + n^L K_1)X$, and the second-period is $Q_2 = (n_2^S + n^L K_2)X$ where X is the per-worker production, which is assumed to be high enough.

2/ The firm operates in a monopolistic competitive market with N firms. The inverse demand function is $p_i = \tilde{a} - \beta q_i - \gamma Q_{-i}$ [1], where Q_{-i} is the total amount of production for the non-i firms and $\tilde{a} \equiv a + \tilde{\epsilon}$ is a stochastic variable with mean a and an IID white-noise error term $\tilde{\epsilon}$. Obviously $\tilde{a}$ and Q_{-i} are exogenous parameters for firm i.

3/ The ex-ante probability, p_c, for a manager not to be fired at the end of the first period increases with his/her consolidation degree (C). This is a binary variable: $C = 1$, if the manager is consolidated, and $C = 0$ otherwise. In particular, we assume that $p_c[C = 0] \equiv \underline{p} < p_c[C = 1] \equiv 1$. And, $\underline{p}$ largely depends, among other things, on the accomplishment of a threshold profit in the first-period [2]. In that case, our assumption of a lower first-period LT workers productivity ($K_1 < 1$) in comparison to ST workers', ensures that $\frac{\partial \underline{p}}{\partial s_1} \equiv K > 0$. To simplify, we are going to consider that K is a constant. Thus, we propose a linear relationship between p_c and s_1 (i.e. $p_c = C + (1 - C)\underline{p}$ with $\underline{p} = K s_1 + \underline{p}_0$ and $K + \underline{p}_0 < 1$).

4/ In the second period, LT workers reservation wage increases because their

[1] This inverse demand function is an extreme case of an oligopoly with N differentiated products (Shubik, 1980), where the representative consumer has the following utility function $U = a\sum_{i=1}^{N} q_i - \frac{1}{N}\{\beta N \sum_{i=1}^{N} q_i^2 + \gamma \sum_{i\neq j=1}^{N} q_i q_j\} - \sum_{i=1}^{N} p_i q_i$ where γ/β is the degree of substitutability between goods. In case of $\beta = \gamma$, and $N \to \infty$, we get in a pure competitive market.

[2] Since profits are stochastic (because of the ex-ante uncertainty in the demand intercept $\tilde{a}$), the ex-ante continuation of a non-consolidated manager is a probabilistic feature.

enhanced skills propel their productivity. As a consequence, their second-period wage w^0, is higher than that of the ST workers in that period ($w^0 > w$). Concerning the …rst period, both types of workers will receive w [3]. Consistently, we also assume that $K_2 > \frac{w^0}{w} > 1$ to be individually rational for the …rm to hire LT workers.

5/ The GM's compensation is a proportion, B, of the …rm's pro…ts [4].

6/ We consider that LT workers' contracts are ‡exible enough to allow the entrepreneur, in the second period, to use such workers contingently (i.e. fewer hours than initially established) and pay them accordingly. We refer to this situation as "labor hoarding" [5].

Time-line of the model

1^{st} period		2^{nd} period	
Ã¡¡¡¡¡¡¡¡¡¡¡¡¡¡¡¡¡¡¡¡¡¡¡¡¡!		Ã¡¡¡¡¡¡¡¡¡¡¡¡¡¡¡¡¡¡¡¡¡¡¡¡¡!	
1/	2/	3/	4/

1/ A manager with a certain degree of consolidation wants to develop a project. To do so, he/she hires n^L LT workers and n_1^S ST workers.

2/ Demand shock $\tilde{e}_1$ is realized and …rst-period pro…ts are generated. Extinction of management's contract depends on the latter pro…ts as well as his/her level of consolidation. If the manager is consolidated, he/she will not be …red in case of bad results. If he/she is not, he/she might be …red contingently on the …rst-period results. If so, a new manager will be hired. First-period disimbursements are made to both workers and the GM.

3/ In the second period, the manager in charge might wish to hire new ST workers.

4/ Second-period pro…ts are generated contingent on the realization of the second-period demand shock $\tilde{e}_2$, and the corresponding disimbursements are made.

[3] The LT workers are not penalized with a lower wage in the …rst period. Arguably, their low productivity is a consequence to devote part of their working time to acquire skills, which, in principle, have some value for the …rm.

[4] To consider a management compensation based on a …x part and a variable part, tied to the …rm's results, does not change the results of our model.

[5] For the importance of labor hoarding in US, see the article "To cut or not to cut" (The Economist 2001). There, it is shown that if not for labor hoarding, the US unemployment rate, currently at 4,4%, would be as high as 5%.

3. SOLVING THE MODEL

We proceed by backward induction. Thus, we first determine the second-period workers (n_2^S). Then, we move on to the first period where management hires LT workers (n^L) as well as the first-period ST workers (n_1^S).

3.1. Second-period Analysis

Management hires the second period workers (n_2^S). To do so, he/she maximizes its expected second-period utility ($E\{U_2^{man}\}$ [6]), which, according to Assumption 5, is a proportion of the firm's second-period profits, π_2. The maximization problem to be solved is:

$$Max_{\{n_2^S\}} E\{U_2^{man}\} = B(E\{\pi_2\}) = B(E\{P_2 Q_2\} - w n_2^S - w' n^L)$$

The solution of this problem is [7]:

$$n_2^S = N^* - n^L K_2 \text{ where } N^* \equiv \frac{a - \frac{w}{X}}{bX} \text{ and } b \equiv 2\beta + (N-1)\gamma \quad (1)$$

We allow n_2^S to be negative. We interpret this situation in terms of some sort of labor hoarding, as was noted in Assumption 6: The manager uses a lower amount of LT workers' hours, and this, in turn, reduces the second-period LT workers' costs by $-n_2^S w$.

3.2. First-period Analysis

In this period, the manager's decision set ($\equiv D^{man}$), is composed of the total number of workers in the first period (N_1) and the proportion of ST workers (s_1) [8]. The manager characterizes these magnitudes maximizing his/her ex-ante expected utility $E\{U^{man}\}$ [9]:

$$Max_{\{D^{man}\}} E\{U^{man}\} \equiv B(E\{P_1 Q_1\} - (n^L + n_1^S)w + p_c E\{\pi_2\})$$

[6] As there is no information acquisition in our model (demand shocks ε are independent), first-period expectations coincide with second-period ones, that is, $E_1\{\} = E_2\{\} \equiv E\{\}$.

[7] To derive the equilibrium, we consider that $Q_{-i;2} = (n-1)q_{i;2}$. Thus, we assume symmetry.

[8] Note that the proportion of second-period ST workers, s_2, can be directly computed making use of the expression $N_1(1 - s_1) = N_2(1 - s_2) = n^L$.

[9] We assume a unit discount factor.

Where p_c is the ex-ante probability of the manager's continuation. As noted above, for a consolidated manager, his/her contract is guaranteed ($p_c = 1$). In contrast, for non-consolidated managers, this ex-ante probability largely depends on the proportion of first-period ST workers.

Solving the previous problem, we obtain the following result:

Proposition

Under the assumptions of our model, the definition of the labor policy for consolidated managers ($C = 1$), is as follows:

- If $K_2 \leq \underline{K}_1 \equiv 1 + \frac{w'}{w} - K_1$; then $s_1 = s_2 = 1$ and $N_1 = N_2 \equiv N^* = \frac{a - \frac{w}{X}}{bX}$
- If $K_2 > \underline{K}_1$, then $s_1 = s_2 = 0$, and $N_1 = N_2 > N^*$. Moreover, there is some "labor hoarding".

On the other hand, for non-consolidated managers ($C = 0$), the equilibrium outcome is the following:

- If $K_2 \leq \underline{K}_0$ with $\underline{K}_0 > \underline{K}_1$, then $s_1 = s_2 = 1$; and $N_1 = N_2 \equiv N^*$.
- If $K_2 > \underline{K}_0$, s_1 and s_2 decrease with K_2 until they reach a zero value. But, if $\underline{p} < K K_1$, some first-period labor hiring is ensured, $s_1 > 0$, independently of the magnitude of the K_2 value.

Proof

See the Appendix.

It follows from Proposition 1 that $s_1[C = 0] > s_1[C = 1]$ as well as $s_2[C = 0] > s_2[C = 1]$. Note, for example, that if second-period LT workers productivity (K_2) satisfies $\underline{K}_1 < K_2 < \underline{K}_0$, the non-consolidated manager hires only ST workers in both periods and the consolidated hires only LT workers. Finally, note that for values of K_2 high enough, there is some labor hoarding [10].

Taking into consideration that $w' > w$ and Proposition 1, we can word the following lemma:

[10] The appearance of the so-called labor hoarding can be justified as follows. When K_2 is sufficiently high, firms have incentives to hire only LT workers as they are very productive in the second-period. The point is, in the first-period they are not so productive, ($K_1 < 1 < K_2$). To compensate for this fact, they are hired in a number that comes out to be excessively high for the second period, given their high productivity in that period. The result is that those LT workers are not fully employed and, consequently, receive a lower wage in the second period. In particular, each LT worker has leisure time, l, which is given by the expression $n^L l w' = -n_2^S w = (n^L K_2 - N^*)w \Rightarrow l = \frac{w}{w'}(K_2 - 1)$ (we have used that $n^L = N^*$ for K_2 high).

Lemma 1

The proportion of ST workers hired by a non-consolidated manager in both periods, is at least as high as that hired by a consolidated manager. As a consequence, the firm's unitary labor costs are lower in the former situation than in the latter, especially, when K_2 is relatively high ($K_2 > \underline{K}_1$).

Proof

Follows directly from Proposition 1.

The driving forces in our model come out as the balance of two opposite effects linked to the LT labor contracting. First, LT workers contribute with a $K_2 > 1$ factor to the rise of the second-period firm's productivity. Second, there is a negative effect, as they contribute with a $K_1 < 1$ factor to the reduction in the firm's first-period productivity. We have motivated this latter feature by the time the LT workers have spent in the initial period acquiring some expertise. However, this negative effect is only relevant for a non-consolidated manager, as the continuation of the consolidated one is guaranteed. This justifies the finding of a ST labor hiring bias for non-consolidated managers, especially in those firms whose activity allows a high rate of growth in their workers' productivity ($K_2 - K_1 > 1 + \frac{w'}{w}$). Firms involved on R&D activities are natural candidates to experience this type of growth in productivity as they, eventually, devote some resources to improve the human capital of their workers, a fact that undoubtedly will increase their productivity (Clark and Griliches, 1998).

Concerning the firm's unitary labor costs, the result of Lemma 1 follows directly from the ST bias of non-consolidated manager as well as from the fact that ST workers receive the same wage, w, in both periods, while second-period LT workers wage, w', is higher than w.

To fully characterize the firm's labor policy we proceed to study the variation in the number of employees. We address this issue by defining a variable, $|N_2 - N_1|$, which is the absolute variation between the number of second-period workers and that of the first-period. We compare this difference in two scenarios. First, when the decision is made by a consolidated manager. Second, when it is made by a non-consolidated one. The result leads to our second lemma.

Lemma 2

The worker variation in non-consolidated manager firms is, at least, as high as that in those with consolidated managers. And, this difference is significant in those cases where there is a high worker productivity ($K_2 > \underline{K}_0$).

Proof

Follows direct from Proposition 1.

The total number of workers is the same in both periods for consolidated-manager …rms. But, this is not true for those with non-consolidated managers. This is related to the ST bias in the labor contracting of these latter …rms. In general, it is reasonable to expect that the higher the proportion of ST workers, the higher the workers variation. Interestingly enough, we …nd that this turnover does not only depend on the managers consolidation degree but on the potential workers' productivity improvement (K_2 ¡ K_1). Thus, as recently-appointed managers are, in general, non consolidated, we expect a positive relationship between manager's and worker's turnover, especially for those …rms with high potential workers' productivity improvements (i.e. …rms involved in some R&D activities).

We may also derive some conclusions concerning the total number of workers that each type of manager globally hires in the two periods of our model.

Lemma 3

For low K_2 values, i.e. $K_2 < \underline{K}_1$, both types of managers hire the same amount of workers for both periods. But, for high values of K_2 (when $\underline{K}_1 < K_2 < \underline{K}_0$ or when there is a null ST labor hiring, $s_1 = 0$), the non-consolidated manager hires less workers in both periods than the consolidated manager does.

Proof

In the appendix.

This result can be explained by the higher probability of continuation of the consolidated manager. This leads the consolidated manager to value especially those workers with a LT contract, because he/she can fully bene…t from the higher second-period productivity of these LT workers. As a consequence, in those situations where LT contracts are of high value, (when K_2 is high), consolidated managers will hire more workers than non-consolidated managers do. This is precisely what Lemma 3 states.

Based on the previous lemmas, we may explicitly de…ne the set of hypotheses to be contrasted in the empirical section:

With relation to Lemma 1, we can investigate the long-term bias in the consolidated manager labor hiring by making use of the …rm's unitary labor costs.

H1: The rate of growth of …rms' unitary labor costs in the period when a GM is replaced is lower than in other years. This e¤ect should be stronger for those …rms that are highly productive (i.e invest heavily on R&D activities).

With relation to Lemmas 2 and 3, that de…ne the variation in the total number of workers of those …rms with a consolidated manager and with a non-consolidated manager, we state the following two hypotheses:

H2: Firms that remove their GM will experience in the following year a higher variation in the number of workers than in those years with no GM replacement. This feature should be especially relevant in those R&D-intensive …rms.

H3: For those …rms with a high potential workers' productivity (i.e. R&D-intensive …rms), the sum of the workers hired in the period of a GM replacement and in the following period, is lower than the sum in those periods with no management replacement.

4. EMPIRICAL ANALYSIS

4.1. Sources of Data

Once we have developed a model that shows the e¤ect of managerial consolidation in the …rm's labor policy, our objective is to test empirically the results of the model. With this aim, we focus on the Spanish case during the period 1994-98. To carry out our research we merged data from two databases that complement each other. The DUNS50000 database provides information on the changes of the managerial structure of the 50.000 more important Spanish manufacturing …rms. Thus, this database becomes instrumental to determine the rotation of the …rm's manager. We use the managerial turnover as a proxy inversely related to managerial consolidation within the …rm. We have considered that the manager who is ultimately responsible of a …rm's labor policy is the general manager (GM). When we do not have this information, we will focus on the CEO, and, as a last alternative, the President. The second database, SABE, provides accounting and …nancial information for more than 200.000 Spanish …rms.

4.2. De…nition of the Variables

Firms are distributed in 19 sectors including those with high, medium, and low variation in the number of …rms' employees, as shown in Table 1 [11]. After merging

[11] We should mention that the 19 sectors of our sample are characterized with a code (CNAE), that has a correspondence with a SIC code which is shown in Table 1. The problem is that this correspondence is not one-to-one, and our sample of 19 CNAE sectors transforms to a sample of 16 SIC sectors. As the original data base is organized in CNAE sectors, we have chosen to

both databases and filtering [12] the resulting one, we are left with an incomplete panel data of 1.054 firms with 5.270 observations during the period 1994-1998.

We define the following variables:

LABCOST is the ratio of labor expenses to the number of employees.

DLABCOST is the difference between, on the one hand, the sum of LABCOST in period t and in period t+1, and, on the other hand, the value of LABCOST in period t-1.

VLABCOST is the ratio of DLABCOST to LABCOST in period t-1 [13]. With this variable, we measure the rate of variation of labor cost from period t-1 to the next two periods.

EMP is the number of firm's employees.

DEMP is a variable which is defined as the difference, in absolute value, between the number of employees in period t+1 and in period t.

VEMP is the difference between, on the one hand, the sum of EMP in period t and in period t+1, and, on the other hand, the value of EMP in period t-1. This variable measures the variation in the number of firm's employees in the "medium-term" (next two periods).

CHANGE is a dummy variable which is equal to 1 (0) if the GM has (not) changed from period t-1 to period t.

RD is a dummy variable which is equal to 1 (0) if, in period t, the firm has invested in R&D [14] more than the average firm in its sector. With this variable we differentiate R&D-intensive firms (RD=1) from non R&D-intensive ones (RD=0). And, as we have mentioned above, we use this variable as a proxy to control for firm's productivity.

SALES is the log of firm's sales.

ROA (return on asset) is the ratio of firm's profits before interest and taxes to total assets.

DEBT is the log of firm's debt.

FINDES is a dummy variable that controls for the existence of situations of financial distress. It is defined by making use of the differences in the ratio of

conduct all the empirical analysis following the CNAE sectorial division to avoid imbalances in our panel data. Throughout the paper, all the codes are referred to the CNAE classification.

[12] We consider as natural filters the existence of accounting information in all the years of the sample, and the non-existence of inconsistent errors like a negative debt account, a negative cash-flow, a negative employment, and/or other negative values in other positive-defined accounts.

[13] That is $VLABCOST_t \equiv \frac{LABCOST_t + LABCOST_{t+1} - LABCOST_{t-1}}{LABCOST_{t-1}}$

[14] We use the R&D expenses to sales ratio as a measure of the firm's R&D investments. With this relative measure, we avoid a size bias.

…rm's pro…ts to interest debt payments. In particular, if this ratio moves from a value higher than two to a value lower than one at the end of the period, then, FINDES is equal to 1. In other cases its value is zero.

A remark about the di¤erence between variable VLABCOST and variable VEMP. We measure the …rm's changes in labor costs as a rate of variation instead of a simple variation as we do to account for the changes in …rm's workers. This is due to the fact that the worker's productivity is a more sticky variable than the number of employees is. Thus, we expect smaller variations in unitary labor costs in comparison to the variations in the number of employees. This leads to use intensive variables to widen the former changes.

4.3. Descriptive Analysis

The values of managerial turnover (CHANGE), the rate of variation in labor costs (VLABCOST), worker turnover (DEMP) and workers variation in the medium term (VEMP) for the di¤erent sectors of our sample are given in Table 1.

PUT TABLE 1 HERE

On average, we can observe that managerial replacement is 11%, and does not di¤er too much for R&D-intensive sectors (29 and 31 CNAE sectors) [15]. We …nd that sectors 27, 34, 35 and 41 are those with the highest managerial turnover rate, and sectors 050, 21, 22, 28 and 36 are those with the lowest. It is remarkable that in sector 34 (car industry), which is among the former sectors, …rms also show a higher worker variation in the short-term as well as a lower rate of variation in the labor cost compared with the mean of the sample. All this relations go in the direction we expected. But, in general, we can not obtain at a sectorial level a clear pattern of connection between management replacement, worker turnover, and rate of variation in the labor costs.

To investigate more closely the linkage between the turnover at the upstream level and that at the downstream one, we show in Table 2 the di¤erences between the means of the variables in those periods when the GM is replaced and when he/she is not. Furthermore, we also di¤erentiate R&D-intensive …rms (RD=1) from non R&D-intensive (RD=0) ones. We make this distinction, because our hypotheses establish more clear relationships for the former …rms (RD=1) than

[15] This contrasts with other countries like the US, where in the former sectors the managerial turnover is up to 30% (see The Economist, 1999)

for the latter. Finally, we have also included a variable, EMP, which measures the number of employees, as an alternative to SALES to account for size effects.

PUT TABLE 2 HERE

The main result shown in Table 2 is that with a 99% confidence level there is a greater variation in the number of employees in the year after a GM replacement in comparison to those years with no managerial change. This result is consistent with our hypothesis 2. Concerning hypothesis 3, the result is not significant for R&D-intensive firms, but, for the general sample the result goes in the opposite direction than we expected. Finally, the rate of variation in labor costs is consistent with the theory for the general sample, but not for those R&D-intensive firms. We will discuss these findings in detail in the next section.

The analysis of the control variables shows, first, in those years where the GM has been replaced, firms' leverage is superior than in other years. Second, the higher the return on assets of a firm, the lower the probability that the manager is replaced. Finally, from the sales and the employment variables, we can draw the conclusion that bigger firms replace their GM more often than smaller ones.

4.4. Econometric Methods

To analyze the previous descriptive evidence in depth, we conduct an econometric analysis to contrast the previous hypotheses.

4.4.1. H1: Changes in Unitary Labor Costs

To test H1, we propose the following equation. It explains the rate of variation in the labor costs (VLABCOST) in terms of changes in the GM (CHANGE).

$$VLABCOST_{it} = \alpha_1 + \alpha_2 CHANGE_{it} + \alpha_3 SALES_{it} + \alpha_4 ROA_{it} + \alpha_5 DEBT_{it} + \alpha_6 FINDES_{it} + \eta_i + \Psi_t + \varepsilon_{it} \quad (2)$$

We include a set of control variables to disentangle possible spurious effects that can affect the GM definition of the firm's labor policy. The SALES variable attempts to capture size effects which might be relevant (Hassink 1996). The ROA variable measures the firm's returns. This is a necessary control given that in our model the firm's productivity is a very relevant variable. We can also interpret this variable as a proxy for the manager's consolidation degree. Consolidation basically depends on the number of years the manager stays within the firm, but also on the returns he/she has achieved in those years. The DEBT variable incorporates issues of firm's risk, as well as the presence of financing constraints, which may be relevant in the definition of the firm's labor policy. We also try to control for the existence of situations of financial distress (FINDES) where we suspect there are important variations in the number of firms' workers as well as in its labor costs because of firm's reorganization following distress. Finally, we also include, firm-specific effects, η_i, as well as temporal effects Ψ_t.

4.4.2. H2 and H3: Variations in the Number of Workers

To conduct the estimation of the variables that define short-term (DEMP) and medium-term (VEMP) variations in the number of employees, we propose a set of equations formally similar to the previous one:

$$DEMP_{it} = \beta_1 + \beta_2 CHANGE_{it} + \beta_3 SALES_{it} + \beta_4 ROA_{it} + \beta_5 DEBT_{it} + \beta_6 FINDES_{it} + \eta_i + \Psi_t + \varepsilon'_{it} \quad (3)$$

$$VEMP_{it} = \gamma_1 + \gamma_2 CHANGE_{it} + \gamma_3 SALES_{it} + \gamma_4 ROA_{it} + \gamma_5 DEBT_{it} + \gamma_6 FINDES_{it} + \eta_i + \Psi_t + \varepsilon''_{it} \quad (4)$$

We estimate the previous three equations using linear regression techniques. And, in all the estimations, we correct for the existence of some unobserved heterogeneity, η_i, that might be correlated with the regressors. The results of the Hausman Test we conduct confirm the relevance of that point. This will lead us to use the panel data structure of our sample to obtain the within group estimators (fixed-effect estimation).

To sum up, according to our theoretical model, we expect α_2 in equation (2) to be negative, which would confirm H1. Moreover, H2 suggests that β_2 in equation (3) should be positive. And, H3 would lead to a negative γ_2.

4.5. Results

Tables 3, 4, and 5 summarize the different estimations. In the first column of each table, we show the results of the within group estimation of the correspondent equation for the general sample, while in the second column we restrict the analysis to those R&D-intensive firms (RD=1). We do not report the cross-sectional estimations, nor the random-effect panel data estimations, because the Hausman test reveals the existence of fixed effects, and only the reported within group estimators are consistent [16].Additionally, the use of panel data, allows to extract the speci…c e¤ect of a change in the …rm's manager on his/her particular …rm labor policy. This is the type of comparison that we are interested in given our theoretical statements, where the comparative statics analysis over some speci…c structural parameters maintains the other constant.

4.5.1. H1: Changes in the Unit Labor Costs

The estimation of equation (2) leads to the following results:

PUT TABLE 3 HERE

Table 3 shows, for the general sample, that management replacement generates a lower rate of variation in unitary labor cost in the replacement period. This is no longer valid for R&D-intensive …rms [17]. This result basically shows that a non-consolidated (recently appointed) manager, restrains from increasing the …rm's labor costs more than a consolidated manager does. In our theoretical model, we have proposed the short-term labor contracting as a possible mechanism that leads to this outcome.

We also observe that the higher the …rm's leverage, the higher the rate of variation in the …rm's unitary labor costs. Those highly leverage …rms that do not invest signi…cantly on R&D seem to be the most ine¢cient in terms of labor cost control. Finally, we have also investigated the e¤ect of ROA. This variable might create potential endogeneity problems because VLABCOST, includes in its de…nition labor costs in period t-1. As these costs have a clear impact on period-t pro…ts, we need to instrument this latter variable. The natural instrument is the same variable lagged one period (ROA1). The result shows a negative sign for this variable in both samples. Firms that generate higher returns are also more e¢cient in the control of unitary labor costs.

[16] In fact, the correlation between the unobservable heterogeneity ($´_i$) and the independent variables (…xed e¤ects) is 35% for equation (3), 45% for equation (4), and 34% for the last equation.

[17] We should mention that we have conducted additional estimations, by making use of a di¤erent criteria to discriminate highly-productive …rms. In particular, we have used the ROA to de…ne highly-productive …rms. These are those with a ROA higher than the average of the sector in each given year. With this alternative criteria to that based on …rm's R&D e¤ort, we recover, for highly-productive …rms, the negative contribution of the managerial replacement on the labor cost variation rate. This basically con…rms our Hypothesis 1.

4.5.2. H2 and H3: Variations in the Number of Workers

The outcome of the estimation of equations (3) and (4) is shown in Tables 4 and 5 respectively:

PUT TABLE 4 HERE

Table 4 shows that in all …rms, but especially in those highly productive (R&D-intensive) …rms, management replacement has a positive impact on the variation of the employment. The CHANGE variable contributes positively and signi…cantly (99%) to the explanation of the DEMP variable. This is, precisely, what H2 states.

With regard to the control variables: The higher …rm's leverage for R&D-intensive …rms, the lower the incentives to change the number of employees. We interpret that these are …nancially-constrained …rms that cannot allow to change continuously between periods (in the short-term) their number of employees. Finally, the sales variable shows that bigger …rms (generally more indebted) tend to change less their workforce between periods [18].

PUT TABLE 5 HERE

Concerning the results of Table 5, we obtain a negative, and signi…cant, sign of CHANGE for R&D-intensive …rms. This ensures that a recently-appointed GM in a R&D-intensive …rm hires in the period of replacement and the next one a lower amount of workers in comparison to those hired in other couple of years by a consolidated manager. This is no longer true for the non-R&D intensive …rms.

In the analysis of the control variables, we …rst have to mention that, as in the estimation of equation (2), a potential endogeneity problem with the ROA variable might appear. Note that DEMP incorporates information of the number of employees in period t-1, which, arguably, might a¤ect period-t pro…ts. To overcome this problem, we have chosen as an instrument for ROA the one-period lagged ROA variable (ROA1).

We …nd, as mentioned above, that big …rms hire more workers than small ones do, especially if they are R&D-intensive …rms. Moreover, the higher the …rm's leverage (eventually connected with the …rm's size), the more intense the …rm's labor hiring policy. In fact, this can be an expression of the asset substitution problem (Myers, 1977), where the leveraged …rms tend to overinvest. In this case by increasing aggressively the number of employees.

[18] Although they increase more their workforce in a two-period basis than smaller …rms (see the positive sign in Table 5).

5. CONCLUDING REMARKS

We have presented a theoretical model that establishes a relationship between the degree of managers consolidation within the …rm and some aspects of his/her labor hiring policy. Our main result is that non-consolidated managers tend to hire more short-term workers than their consolidated counterparts. This fact leads to a lower variation rate in the unitary labor costs in the former situation in comparison to the latter. A second result is that the variability in the number of workers is superior when a non-consolidated manager decides the labor policy than when a consolidated manager does. Both results come out to be especially strong for highly productive (i.e. R&D-intensive) …rms. And, productive …rms with a consolidated manager tend to hire, in the medium term, more workers than …rms with a non-consolidated manager. These theoretical outcomes are empirically tested by making use of a data sample composed of 1.054 manufacturing Spanish …rms. The results we have obtained con…rm that, e¤ectively, the less consolidated the manager, the higher the variability of the …rm's workforce, the lower the variation rate of the …rm's labor costs, and, for highly-productive …rms, the lower the amount of workers hired in the medium term (the following two periods).

Several extensions are possible. In the theoretical model, we could introduce aspects related to the manager's risk aversion, which, in principle, should bias the results even more in the direction we have pointed out. A non-consolidated risk-averse manager is going to focus on the short-term results to a greater extend than a risk-neutral manager does. As a consequence, the short-term workers hired bias is going to increase. Regarding the empirical work, this could also be extended by incorporating explicitly issues of workers contract length.

Another aspect worth mentioning the possibility of extending this analysis to other hierarchical levels within the …rm. Thus, to consider not only the relationship between top managers and workers, but also to take into consideration the medium-level managers. Other interesting analysis to carry out is to focus on particular types of …rms like family …rms and compare the results with non-family ones. We suspect that the e¤ect of managerial turnover on workers variations will be clearly lower in the former …rms than in the latter. This will be the subject of future research.

THEORETICAL APPENDIX

1

We maximize the manager's utility function $U_1^{man} \equiv U$:

$Max_{\{s_1;N_1\}} E\{U\} =$ [19] $(a - \beta q_1 - \gamma Q_{-1})q_1 - N_1 w + p_c E\{\pi_2\}$ (A1.1)

S.t. $\pi_2 = (a - \beta q_2 - \gamma Q_{-2})q_2 - (w' N_2(1-s_2) + wN_2 s_2)$ (A1.2)

S.t. $q_2 = N_2^* X$ (by (1)), $q_1 = N_1F_1X$ and $F_1 \equiv 1-(1-s_1)(1-K_1)$

The FOC (we use the fact that once in equilibrium $Q_{-i} = (n-1)q_i$) leads to:

$\frac{\partial U}{\partial N_1} = (a - bN_1F_1X)F_1X - w + p_c(1-s_1)(K_2w - w') = 0$ (A1.3)

$\frac{\partial U}{\partial s_1} = N_1\{(a-bN_1F_1X)(1-K_1)X - p_c(K_2w-w')\} + \frac{\partial p_c}{\partial s_1}E\{\pi_2\} = 0$ (A1.4)

$b \equiv 2\beta + (n-1)\gamma$ and $\pi_2 = \beta(N_2^*X)^2 + N_1(1-s_1)(K_2w-w')$ (A1.5)

From (A1.3) $(a - bN_1F_1X) = \frac{1}{F_1X}\{w - p_c(1-s_1)(K_2w-w')\}$ (A1.6)

$\frac{\partial U}{\partial s_1} = \frac{N_1}{F_1}\{w(1-K_1) - p_c(1-F_1)(K_2w-w') - F_1p_c(K_2w-w')\} + \frac{\partial p_c}{\partial s_1}E\{\pi_2\} =$

$=$ (by A1.5) $\frac{N_1}{F_1}\{w(1-K_1) + (K_2w-w')(F_1\frac{\partial p_c}{\partial s_1}(1-s_1) - p_c) + \frac{F_1}{N_1}\frac{\partial p_c}{\partial s_1}\beta(N_2^*X)^2\}$ (A1.7)

And from (A1.6) $N_1 = \frac{1}{bF_1X}\{a - \frac{w}{F_1X}[1 - p_c(1-s_1)(K_2 - \frac{w'}{w})]\}$ (A1.8)

We distinguish two situations; C = 1 and C = 0.

• C = 1 ($p_c = 1 \Rightarrow \frac{\partial p_c}{\partial s_1} = 0$):

$\frac{\partial U}{\partial s_1} = \frac{N_1}{F_1}\{w(1-K_1) - (K_2w-w')\} = \frac{N_1w}{F_1}\{1+\frac{w'}{w} - K_1 - K_2\}$ (A1.9)

- For $K_2 \le \underline{K}_1 \equiv 1 + \frac{w'}{w} - K_1 \Rightarrow \frac{\partial U}{\partial s_1} > 0 \Rightarrow s_1 = 1$ (A1.10)

In that case (A1.8) transforms to ($F_1 = 1$) $N_1 =$ [20] $N_2 = N^* \equiv \frac{a - \frac{w}{X}}{bX}$ (A1.11)

- For $K_2 > \underline{K}_1$, we have $\frac{\partial U}{\partial s_1} < 0 \Rightarrow s_1 = 0$ (A1.12)

And by (A1.8) ($F_1 = K_1$) $N_1 = \frac{1}{bK_1X}\{a - \frac{w}{K_1X}(1-\underline{p}_0(K_2 - \frac{w'}{w})\} >$ [21] N^* (A1.13)

As $N_1 > N^* \Rightarrow n_2^S = N^* - K_2N_1 < 0$ (labor hoarding), then, $N_1 = N_2$ (A1.13').

• C = 0 ($\frac{\partial p_c}{\partial s_1} = K$)

From (A1.7) $\frac{\partial U}{\partial s_1} = \frac{N_1p_cw}{F_1}(\frac{1-K_1}{p_c} + \frac{w'}{w} + \frac{F_1K}{N_1p_cw}E\{\pi_2\} - K_2)$ (A1.14)

- The equilibrium for $s_1 = 1$ ($F_1 = 1$, $p_c[s_1 = 1] \equiv \overline{p} = \underline{p}_0 + K$) is given by:

$\frac{\partial U}{\partial s_1} = N_1w\overline{p}\{\frac{(1-K_1)}{\overline{p}} + \frac{w'}{w} + \frac{K}{w\overline{p}N_1}\beta(N_2^*X)^2 - K_2\} > 0$ (A1.15)

Thus, $s_1^* = 1$ for $K_2 < \underline{K}_0 = \frac{(1-K_1)}{\overline{p}} + \frac{w'}{w} + \beta K\frac{N_2^*X^2}{w\overline{p}} > \underline{K}_1$ (A1.16)

For $s_1 = 1$ (by (A1.11)) $N_1 = N_2 = N_2^*$ (A1.17)

- On the other hand, for $K_2 > \underline{K}_0$

In that case s_1^* will be an interior solution. Moreover, s_1^* decreases with K_2. This

[19] We neglect the constant B in the management retribution.

[20] By (1) $n_2^S = N^* - n^L K_2 = N^* = N_2$ ($s_1 = 1$)

[21] By Assumption 1, X is high enough. A threshold to ensure this inequality is that $X > \frac{w}{a}(1 + \frac{1+k_1}{k_1^2})$

can be seen from (A1.7):

$\frac{\partial U}{\partial s_1} = \frac{N_1}{F_1}\{w(1-K_1)+(K_2 w - w')(F_1 K(1-s_1)-p_c)+\frac{F_1 K}{N_1}\beta(N_2^* X)^2\} = 0$ (A1:7)

A necessary condition for s_1^* to be an interior solution is $p_c > F_1^* K(1-s_1^*)$ (A1:18)

From (A1.17) $\frac{\partial s_1^*}{\partial K_2} = -\frac{\frac{\partial^2 U}{\partial s_1 \partial K_2}}{\frac{\partial^2 U}{\partial (s_1^*)^2}} = -\frac{N_1 w/F_1}{\frac{\partial^2 U}{\partial (s_1^*)^2}}(F_1^* K(1-s_1^*)-p_c) < 0$ (by (A1:18) and the concavity condition $\frac{\partial^2 U}{\partial s_1^2} < 0$ in s_1^* [22]).

Regarding $\frac{\partial s_2^*}{\partial K_2} = \frac{\partial}{\partial K_2}\{\frac{n_2^S}{N_2}\}$ = (by (1)) $\frac{\partial}{\partial K_2}\{1 - \frac{N_1^*(1-s_1^*)}{N^* - N_1^*(1-s_1^*)(K_2-1)}\} < 0$. This follows directly from $\frac{\partial}{\partial K_2}\{N_1^*(1-s_1^*)\} > 0$, where we have used $\frac{\partial s_1^*}{\partial K_2} < 0$ and $\frac{\partial N_1^*}{\partial K_2} > 0$ from (A1.8). This last relationship is ensured when X is high enough [23].

Finally, (A1.7) shows that $\underline{p}_0 < KK_1 \Rightarrow \frac{\partial U\{s_1=0\}}{\partial s_1} > 0 \Rightarrow s_1^* > 0 \; \forall K_2$ (A1:19)

□

If $\underline{K}_1 < K_2 < \underline{K}_0 \Rightarrow$ (by (A1.13) and (A1.17)) $N_1[C=1] = N_2[C=1] > N^* = N_1[C=0] = N_2[C=0]$

If K_2 is high and $\underline{p}_0 > KK_1$ (by A1:19), both managers hire only LT workers ($s_1 = 0$). Thus from (A1.8) and the fact that $F_1[s_1 = 0] = K_1$ we get

$N_1[s_1 = 0] = \frac{1}{bK_1 X}\{a - \frac{w}{K_1 X}(1 - \underline{p}_0(K_2 - \frac{w'}{w})\}$ with $\frac{\partial N_1}{\partial \underline{p}_0} > 0$.

As $\underline{p}_0 \equiv p[C=0; s_1=0] < 1 = p_c[C=1]$, we can ensure (by A1.13')

$N_1[C=1; s_1=0] = N_2[C=1; s_1=0] > N_1[C=0; s_1=0] = N_2[C=1; s_1=0]$

[22] A direct inspection of (A1.7) shows that $\frac{\partial^2 U}{\partial (s_1^*)^2} < 0$

[23] From (A1.8), a sufficient threshold is given by $p_c(1-s_1^*)(\overline{K}_0 - \frac{w'}{w}) \equiv p_c^2(1-s_1^*)(\frac{(1-K_1)}{P} + \beta K \frac{N_2^* X^2}{w\overline{p}}) > 1$

TABLE 1

SIC	CNAE	DESCRIPTION	Observs	Change (Mean, %)	Vlabcost (Mean)	Demp (Mean)	Vemp (Mean)
2	013	Agricultural Production Livestock	9	0	1,28	2,71	40,2
9	050	Hunting and Fishing	65	5,77	1,22	10,29	79,08
20	15	Food Products	1120	10,38	1,17	17,43	171,19
22	17	Textile	55	13,64	1,05	11,73	108,73
22	18	Tailoring and Furs	185	10,13	1,17	10,06	143,97
26	21	Paper Products	245	8,16	1,28	10,05	166,24
27	22	Printing, Publishing Industries	198	6,33	1,17	7,73	105,28
30	24	Chemistry Industry	805	13,91	5,38	42,37	148,23
30	25	Rubber and Miscellaneous Plastics Products	357	13,68	1,14	11,97	241,13
32	26	Stone, Clay, Glass, and Concrete Products	335	10,45	1,25	13,28	162,28
33	27	Primary Metal Industries	130	17,65	1,12	16,46	203,81
34	28	Fabricated Metal Product Except Machinery and Transportation	557	8,31	1,13	10,44	116,43
35	29	Industrial and Commercia Machinery and Computer Equipment	410	10,06	1,16	15,81	181,38
36	31	Electronic and Other Electrical Equipment, and Components	190	11,84	1,13	22,79	342,27
37	34	Car Industry	260	14,42	1,31	22,80	286,03
37	35	Transportation Equipmen	69	14,54	1,15	124,3	454,56
25	36	Furniture and Fixture	140	8,03	1,25	12,59	120,04
49	40	Electric, Gas, and Sanitary Services	60	12,50	1,37	17,62	247,11
49	41	Water Industry	70	16,07	1,15	22,95	268,74
Mean of the Sample				11,12	1,83	20,39	178,35

TABLE 2

	Change=1 *(General sample)*	Change=0 *(General sample)*	t-test	Change=1 (RD=1)	Change=0 (RD=1)	t-test
Main variables						
VLABCOST	***1,22***	***1,91***	***0,34 (0,73)***	***1,51***	***1,18***	***1,91(0,06)***
DEMP	***31,91***	***15,03***	***4,21 (0,00)***	***84,56***	***18,57***	***3,15 (0,00)***
VEMP	***245,18***	***169,58***	***2,55 (0,01)***	***279,98***	***226,08***	***0,85 (0,39)***
Control Variables						
SALES	***13,44***	***13,13***	***3,23 (0,00)***	***13,53***	***13,35***	***0,93 (0,35)***
ROA	***0,07***	***0,09***	***4,13 (0,00)***	***0,04***	***0,09***	***3,97 (0,00)***
DEBT	***13,60***	***13,15***	***6,07 (0,00)***	***14,18***	***13,65***	***3,06 (0,00)***
EMP	***247,24***	***174,01***	***3,37 (0,00)***	***317,27***	***227,02***	***1,62 (0,10)***
Number of observations	***467***	***3733***		***75***	***577***	

TABLE 3

	Panel data estimation General sample (t-value)	*Panel data estimation R&D-intensive firms (t-value)*
Main variables		
CHANGE	***-0,16*****	***-0,09***
	(1,84)	***(0,79)***
Control variables		
SALES	***0,03***	***0,20***
	(0,06)	***(1,16)***
ROA1	***-1,52******	***-1,83******
	(3,75)	***(3,46)***
DEBT	***0,16******	***0,20***
	(2,20)	***(1,38)***
FINDES	***-0,01***	***-0,14***
	(0,12)	***(1,54)***
Constant	***-1,16***	***-1,77******
	(0,99)	***(2,47)***
Number of observations	***1931***	***1931***
Pseudo R^2	***2,69***	***9,80***
F test	***3,62 (0,00)***	***3,11 (0,00)***

****** Significant at the 1% level***
***** Significant at the 5% level***
**** Significant at the 10% level***

TABLE 4

	Panel data estimation General sample (t-value)	*Panel data estimation R&D-intensive firms (t-value)*
Main variables		
CHANGE	***15,49****	***52,51****
	(3,03)	***(3,21)***
Control variables		
SALES	***-6,67***	***-55,72****
	(1,82)	***(2,48)***
ROA	***19,78***	***64,96***
	(0,71)	***(0,74)***
DEBT	***-6,13***	***-36,52***
	(1,42)	***(1,86)***
FINDES	***-1,27***	***-2,77***
	(0,24)	***(0,16)***
Constant	***181,75****	***1270,19****
	(2,59)	***(3,71)***
Number of observations	***1931***	***1931***
Pseudo R^2	***1,92***	***14,76***
F test	***2,57 (0,01)***	***4,96 (0,00)***

****** Significant at the 1% level***
***** Significant at the 5% level***
**** Significant at the 10% level***

TABLE 5

	Panel data estimation General sample (t-value)	Panel data estimation R&D-intensive firms (t-value)
Main variables		
CHANGE	***-9,31***	***-69,00*****
	(0,97)	***(1,90)***
Control variables		
SALES	***12,70*****	***103,28******
	(1,83)	***(2,40)***
ROA1	***-36,45***	***-24,95***
	(0,80)	***(0,16)***
DEBT	***23,14******	***103,28******
	(2,86)	***(2,40)***
FINDES	***0,64***	***-4,24***
	(0,07)	***(0,11)***
Constant	***-283,71******	***-2782,45******
	(2,16)	***(3,70)***
Number of observations	***1931***	***1931***
Pseudo R^2	***1,92***	***10,94***
F test	***2,57 (0,00)***	***3,52 (0,00)***

****** Significant at the 1% level***
***** Significant at the 5% level***
**** Significant at the 10% level***

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