Executive Compensation in Hungary

By

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Abstract

In this paper, I aim to shed light on the nature of executive compensation in Hungary between 1994 and 2008. I divide the managers into first and second rank managers, and through observing their wages, regular bonuses, and non-regular bonuses as well as gender status, human capital measures and firm information, I set forth to observe whether executive compensation can be explained accordingly, or whether there exist hints of managerial entrenchment. After using Ordinary Least Squares and Fixed Effects Estimation methods and conducting different robustness checks, I find that the forms of compensation used in this paper are not affected by common measures of firm size and performance, but only by gender status, human capital measures, and ownership type, which indicates that firm performance and firm size have no effect on executive compensation, which raises questions about the role of managers in controlling their own salaries through private benefits of control and managerial entrenchment.

Acknowledgements

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"What I object to is the people that the-- the biggest payday of their life is the day that they leave a company from which they failed. Pay for performance is fine….Pay for showing up is not-- with the-- with the huge goodbye present, you know-- or-- or bonuses that are not tied to real performance, I think that's terrible."

- Warren Buffet

1. Introduction

Three years after the 2007-2008 financial meltdown, the general public is still concerned and sometimes outraged at the sums of compensation received by top level executives. In 2009, Merrill Lynch bonuses to their executives totaled $3.6 billion, which is roughly one third of the money the firm received from the Federal Reserve in the form of bailouts under the Troubled Asset Relief Program (TARP) conditions (Slack 2009). And while high levels of executive compensations are not a new phenomenon, complacency in placing compensation arrangements that do not serve the shareholders' interest have been heavily scrutinized lately at least in the eye of the general public.

Recent growth in executive compensation and the questions about whether CEOs have the ability to influence their own compensation - especially for top paid managers - are hardly new topics in the corporate governance and financial economics literature. Some researches argue that executive compensation levels are a result of market equilibrium, where the board of directors and those in charge of company management need to structure compensation levels and packages that attract and retain talented executives (Baranchuk, MacDonald and Yang (2006), Gabaix and Landier (2008), Michael C. Jensen (2004)). Proponents of this approach believe that the pay system is good as is, and that top executives do not hold that much sway over the company decision. Indeed, Jensen and Murphy (1990) estimate changes in the pay-performance relationship of top executives, taking into account actually pay, options, stockholding, and dismissal packages. Although they find large incentives related to stock incentives, they conclude that most CEOs hold too small a fraction of the company's stock. Furthermore, the authors show that this ownership level has declined over the past 50 years, and find a general

decline in what they dub 'pay-performance' relation and the levels of CEO compensations, which they explain as the result of private and public political forces.

However, more recent literature argues that there are sizable increases in executive compensation, and that such increases are due to corporate governance shortcomings and private benefits of control (Bebchuk and Fried (2003), Bebchuk and Fried (2004), and Bertrand and Mullainathan (2001)). In fact, Bebchuk and Fried (2004) argue that problematic compensation arrangements and high levels of executive pay are due to the absence of effective arm's-length dealing[1] in corporate governance today, and are not simply errors or lapses of judgment. The authors argue that our corporate governance system give boards – which can be easily influenced by managers - too much power and relies on them to keep the firm's executives in check. To remedy this, directors need to be made more independent and more in tune with the shareholder's interests and less insulated from them.

Empirical studies on the inefficacy of executive pay have supported such a view, like the work of Bebchuk and Grinstein (2005) who examine the growth of U.S. executive pay during the period 1993-2003. They find that during this period, executive compensation has grown disproportionately to the increase that can be explained by changes in firm size, performance and industry classification. They also find that equity based compensation has also increased drastically and that it was not accompanied by a substitution of a decrease in regular non-equity pay. The authors argue that this increase in pay is acceptable under booms in the market (performance based compensation can be justified) and that the increase in public outrage is one of the main reasons for the increase in equity based compensation. As an example, the authors

[1] An arm's length bargaining model stipulates that compensation packages are a result of "arm's length" arrangements between executives and directors.

explain that the rise in compensation in the form of stock options is utilized so that executives can circumvent the public outrage that is likely to follow had they just announced the compensation in simple dollar value, since the average layman is unlikely to understand the true value of increases in compensation when presented in option pricing as opposed to nominal dollar values. The authors also state that the increase in the levels of entrenchment of firm executives since the 1990s, especially with the adoption of antitakeover laws, provides top level executives with more protection, which in turn allows them greater protection from takeovers and allows raises in pay level.

Many factors seem to affect executive compensation. McKnight et al (2000) investigate the effect of age on executive compensation through the UK sample. The study also splits pay into salaries, bonuses, and share options, and finds that while age is positively related to executive compensation, it weakens over time, and that the form of compensation favor bonuses more highly as the CEO get older.[2] Moreover, there is ample literature on the effects of the type of ownership on firm performance (Barbosa and Louri (2003), Globerman et al (1994), and La Porta et al (2008)); therefore, by extension, if we accept that different ownership types affect performance, it is logical to suspect that managers operating under different types of ownership might be compensated differently (Tatako and Long (2004)).

Other factors that affect executive compensation are CEO and worker salaries, which account for labor market conditions (Hu and Zhou (2006)), and using industry and group benchmarks to set a level of pay (Faulkender and Yang (2008)).

[2] In my specification, I utilize education experience, which when used together, can proxy for age.

In this paper, I aim to follow in the similar empirical specifications to those used in the above discussed literature and shed light on executive compensation in Hungary. I use Hungarian firm level panel data for the years 1994 – 2008 containing three compensation components: simple salary, regular bonus, and non-regular bonus. I clean the data and separate the managers into first rank and second rank levels, and analyze different firm and industry performance components, demographics, and ownership structures affecting their compensation levels through Ordinary Least Squares regressions and Fixed Effects regressions. I use these specifications to determine how managers are compensated, what are the causes in differences in the levels of compensation and discus if some level of executive compensation be attributed to manager entrenchment or are managerial wage levels always explained by variations in firm performance, ownership and industry structures. I find that executive compensation responds as expected to gender status and human capital measures i.e. female managers earn less than male managers, and more educated and experienced managers earn more. The highest determinant of executive compensation seems to be the ownership status of the firm, where both foreign owned private firms and state firms reward their managers more than private domestic firms, ranging from 1.5-8.5% more under Fixed Effects estimation, depending on the compensation and ownership types. More interestingly, firm performance measures against industry benchmarks seem to have little or no effect on executive compensation in Hungary regardless of the type of ownership of the firm.

Section II discusses the data, its cleaning and its management and presents the descriptive statistics. Second III discusses the utilized methodology and the different specifications. Section IV presents the results and some robustness checks, and section V concludes.

2. Data

The source of data used for the analyses is the Hungarian Wage Survey, which is hosted by the National Employment Office, and gathers data on workers and their earning every three years between 1986 and 1992, and then annually since then. The last round I use in the analysis is 2008. In 1986 and 1989, workers were selected from a narrow occupational group, and were represented by a two-digit occupation code. These two digit occupational codes were not specific enough for the purposes of this analysis, as it is impossible to identify different types and ranks of executive. Therefore, this analysis starts with 1994, where the sample design changed and workers were selected randomly based on their date of birth at fixed intervals. Production workers were selected if born on the 5^{th}, or 15^{th} of a given month, and non-production workers – managers included – were chosen if born on the 5^{th}, 15^{th}, or 25^{th} of a given month. Starting from 1996, this manner of sample selection was continued for medium and large firms, but still all employee information was gathered from smaller companies. A small company was defined as a company with less than 20 employees between 1996 and 2001, and less than 50 employees starting from 2002. Although this ensures that the sample is random, it means that if a firm does not have workers who were born on the given days, then the firm is missing from the sample. This means that the probability of being included increases with the size of the firm.[3] To get a more detailed view into the data set, I observed how firms were sampled from 1994 - 2008.

The following table represents the summary statistics of this process:

[3] For detailed discussion about the nature and collection of the data set see Antal, Earle and Telegdy (2011)

Table 1: Frequency at which firms were sampled 1994 – 2008

Summary Statistic	Value
Mean	2.793
Median	2
Std. Dev.	2.814
Minimum	1
Maximum	15

This shows that the average firm remained in the sample for around 2.8 years, with a standard deviation of 2.8, and that half of the sampled firms where present for two years or less. At minimum a firm was sampled once, and at maximum a firm was sampled 15 times i.e. for the entire duration of the time period.

The data set contains firm level information, including totals assets, tangible assets, long and short term debt, liabilities, number of workers employed and the total wage bill, pre-tax profits and net sales. The ownership structure of each firm is also reported in the sample. A firm can either be state owned or privately owned, and if privately owned, then the firm is either domestically owned or foreign owned. The dummy variables representing ownership structure are thus coded accordingly. Moreover, each firm in the sample is assigned a four digit ISIC industry code according to Revision 3.1 under the 2003 Statistical Classification Activities in the European Community and a less detailed two digit code. Industry codes are also grouped into a two digit code under the same system. Occupational codes for all sampled workers are also present and classified according to the 1993 Hungarian Standard Classification of Occupations. A categorical education variable is also provided which reflects the highest finished schooling level, where each higher number represents more and more years of education, which I divide

into four separate categorical variables.[4] As for managers, the data set contains a normal salary, regular bonus and non-regular bonus variables, all of which are I adjusted to thousands of Hungarian forints (HUF) and presented in 2009 values. It is also worth noting that these measures only include cash values. Hungarian stocks do not have option dealings, and so this form of compensation does not come into play for Hungarian manager compensations, but other forms of compensation such as equity based compensation, rewards through pension systems and severance packages are not available in this data set. In addition, basic demographic information regarding managers as well as all workers such as gender, age, and experience are also available.

In order to properly analyze executive compensation, certain firm performance measures need to be created from the available data set. First, I converted all nominal values to real values. All money values reported in this analysis are in 2009 thousands of Hungarian forints (HUF). Furthermore, as a measure of firm performance I will use Return on Assets, defined as the ratio of pre-tax profits to the net total assets of the company. Furthermore, I separated the manager from the non-manager workers in the sample using the provided occupation codes. Moreover, to further isolate the different effects on managerial compensation, I further used the detailed four digit occupation codes to divide the managers into first and second rank managers. I defined first rank managers as general managers of business organizations and budgetary institutions (occupational codes 1311 – 1312), and second rank managers as department managers of business organizations and budgetary institutions as well as managers of functional units in business organizations and budgetary institutions (occupational codes 1321 – 1349).[5]

[4] For detailed information regarding the education system in Hungary, please refer to the figure 3 in the Appendix
[5] For detailed information on the specific codes for managers and what exact occupation is under each rank please refer to table (7) in the appendix.

For each of the two ranks of managers, I calculated by year the salary, regular and non-regular bonuses as well as the basic demographic described above. This is presented in tables (2) and (3) overleaf. I have also provided a graphical representation of the increase in the different wage components through measuring the rolling average of each of the simple salary and the two bonuses for both the first and second rank managers. Following Bebchuk and Grinstein (2005), I define the rolling average as the average of the compensation level for each of the two ranks in that year and the previous two years. As the figure indicates (shown overleaf), while first rank managers have higher sums of compensation, it is difficult to discern a trend in the compensation levels of first rank managers, while on the other hand; average compensation levels for second rank managers seem to follow a slight positive trend through the sampled years. Both the tables and the graphical figure show that the regular bonus is a small component and contributes very little to the overall compensation levels. This is mostly due to the fact that few of the sampled managers receive a regular bonus at all compared to the high amount of non-regular bonuses, which are usually much larger in value and get paid out more often to both the first and the second rank managers.

Table 2: First and Second Rank Manager Demographics 1994-2008:

The following table displays mean and standard deviation values of the demographics of first and second ranked managers detailed across the years in the sampled firms. *Age* and *experience* are measured in years, *female* is the percentage of managers that are female, *Primary*, *Secondary*, *Vocational* and *University* indicate that the subject finished Primary school, secondary school, vocational training, and college or University respectively.

Variables	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
1st Rank Managers															
N	1449	1397	1344	1471	1466	1682	2055	2140	2209	2050	2574	3148	2988	2223	2476
Female	0.168	0.164	0.175	0.168	0.172	0.178	0.193	0.190	0.202	0.198	0.213	0.217	0.219	0.225	0.236
Primary	0.001	0.001	0.005	0.003	0.002	0.002	0.004	0.002	0.004	0.004	0.005	0.005	0.004	0.004	0.004
Secondary	0.135	0.153	0.137	0.156	0.147	0.187	0.224	0.246	0.253	0.226	0.247	0.257	0.264	0.216	0.232
Vocational	0.110	0.105	0.115	0.117	0.111	0.117	0.108	0.107	0.074	0.081	0.068	0.070	0.082	0.065	0.061
University	0.753	0.740	0.741	0.723	0.740	0.694	0.662	0.644	0.669	0.686	0.677	0.666	0.650	0.713	0.699
Age	46.277 (7.295)	46.231 (7.382)	46.735 (7.337)	47.030 (7.351)	47.063 (7.511)	47.562 (7.760)	47.252 (8.275)	47.688 (8.442)	47.249 (9.334)	48.295 (9.261)	47.537 (9.520)	46.849 (9.991)	47.488 (9.998)	47.290 (10.181)	47.348 (10.053)
Exp.	24.978 (7.431)	24.970 (7.503)	25.522 (7.494)	25.897 (7.530)	25.857 (7.631)	26.458 (7.826)	26.447 (8.333)	26.974 (8.538)	26.488 (9.297)	27.447 (9.189)	26.779 (9.520)	26.171 (9.912)	26.929 (9.937)	26.449 (10.296)	26.481 (10.203)
2nd Rank Managers															
N	4814	4778	4262	4301	4015	4338	4269	3975	5074	4098	5338	6231	5576	4826	5095
Female	0.405	0.400	0.406	0.396	0.398	0.400	0.390	0.381	0.384	0.400	0.395	0.398	0.389	0.418	0.382
Primary	0.004	0.008	0.003	0.005	0.004	0.003	0.006	0.005	0.002	0.003	0.003	0.005	0.002	0.004	0.004
Secondary	0.252	0.256	0.250	0.224	0.227	0.240	0.241	0.248	0.242	0.271	0.281	0.317	0.265	0.254	0.250
Vocational	0.150	0.137	0.116	0.107	0.105	0.092	0.090	0.089	0.071	0.079	0.057	0.063	0.078	0.063	0.048
University	0.595	0.600	0.630	0.664	0.662	0.664	0.662	0.658	0.685	0.646	0.658	0.615	0.654	0.676	0.688
Age	44.502 (7.838)	44.572 (8.128)	44.621 (8.195)	44.498 (8.442)	44.566 (8.350)	44.724 (8.797)	44.305 (9.266)	44.753 (9.481)	44.665 (9.761)	45.089 (9.906)	44.589 (10.244)	44.0173 (10.333)	44.180 (10.429)	44.358 (10.384)	44.438 (10.304)
Exp.	23.947 (8.246)	24.050 (8.486)	23.947 (8.530)	23.698 (8.783)	23.817 (8.699)	23.940 (9.104)	23.553 (9.614)	24.037 (9.780)	23.776 (10.042)	24.449 (10.229)	23.924 (10.506)	23.561 (10.582)	23.541 (10.689)	23.609 (10.653)	23.841 (10.602)

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Table 3: Components of First and Second Rank Manager Compensations 1994-2008:

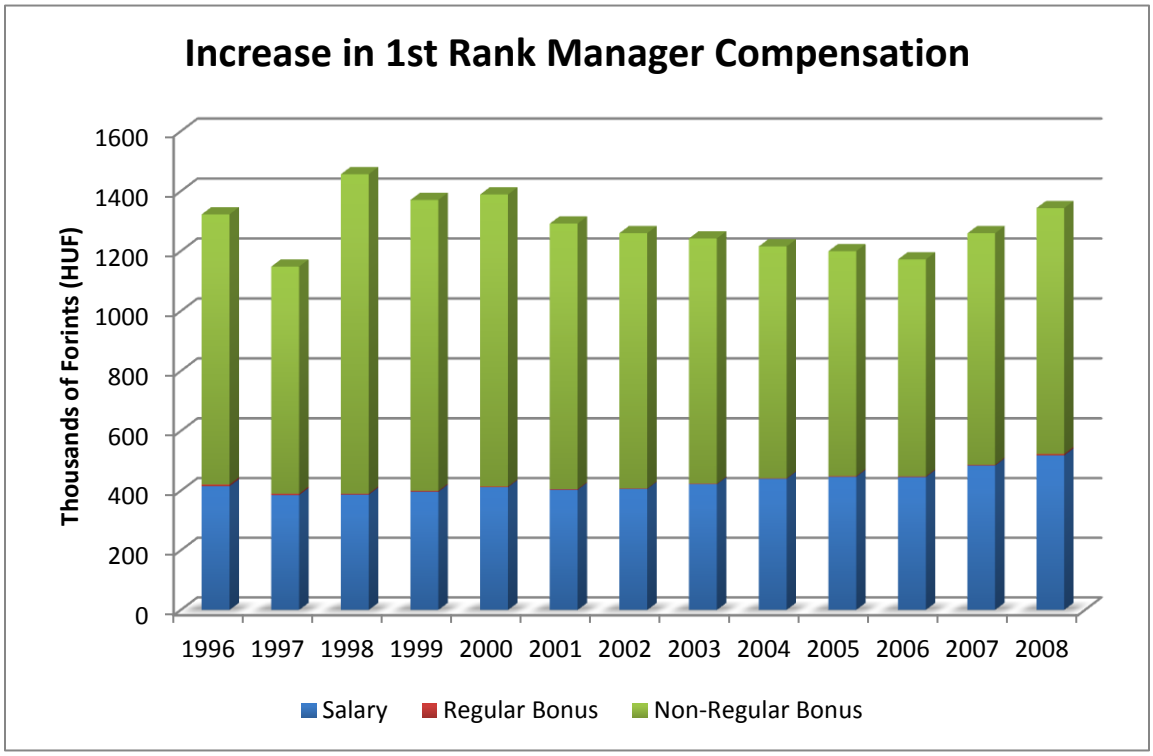
The following table displays mean compensation values and the standard deviation for first and second rank executives in the sampled firms. *W* denotes the regular wage or simple salary, *B1* represents regular bonus received and *B2* represents non-regular bonus received. All values are adjusted for inflation and are in 2009 thousands of Hungarian Forints (HUF).

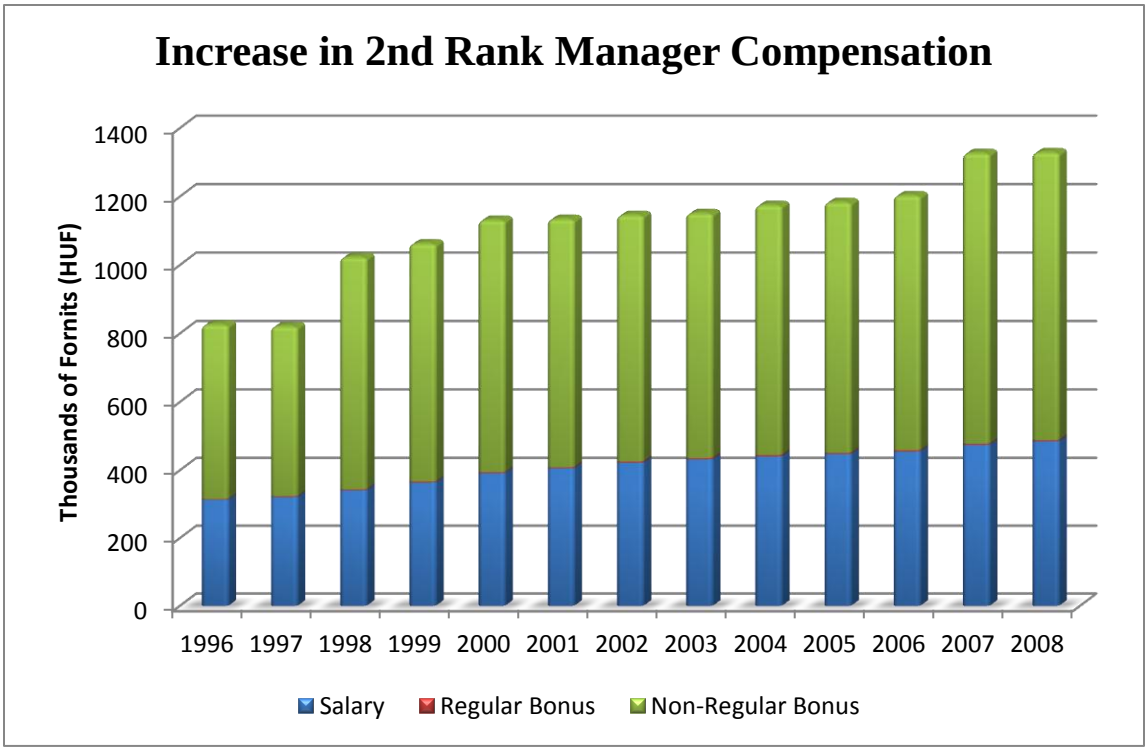
Var.	1994	1995	1996	1997	1998	1999	2000	2001	2002[+]	2003[+]	2004[+]	2005[+]	2006[+]	2007[+]	2008[+]
1st Rank Managers															
N	1449	1397	1344	1471	1466	1682	2055	2140	2209	2050	2574	3148	2988	2223	2476
W	450.499	412.318	381.992	361.936	416.353	411.479	407.571	389.857	421.296	454.596	443.864	441.777	451.505	559.225	544.451
	(372.518)	(365.76)	(344.58)	(333.68)	(436.22)	(465.60)	(571.32)	(521.16)	(555.13)	(577.46)	(554.25)	(540.12)	(585.41)	(756.87)	(685.08)
B1	6.949	5.740	4.400	3.306	2.322	3.981	1.288	2.278	1.103	1.413	2.638	3.109	2.376	2.439	9.940
	(82.25)	(85.44)	(73.45)	(57.22)	(28.43)	(45.68)	(17.46)	(36.75)	(16.27)	(28.91)	(30.40)	(34.88)	(28.39)	(29.51)	(88.70)
B2	1323.116	202.109	1181.126	892.569	1125.762	895.194	903.530	860.864	792.451	804.067	724.956	722.865	724.108	871.442	865.442
	(2491.54)	(766.84)	(2496.17)	(1996.54)	(2819.78)	(2458.27)	(3151.15)	(2661.94)	(2334.60)	(2601.81)	(3239.88)	(2422.83)	(2628.81)	(2414.20)	(2858.83)
2nd Rank Managers															
N	4814	4778	4262	4301	4015	4338	4269	3975	5074	4098	5338	6231	5576	4826	5095
W	316.806	309.514	312.424	341.737	368.768	380.843	424.077	412.070	430.854	452.860	439.116	450.717	475.852	497.053	482.433
	(191.283)	(203.64)	(215.94)	(266.40)	(273.77)	(304.13)	(393.65)	(348.93)	(370.50)	(376.61)	(441.009)	(411.10)	(464.68)	(437.86)	(416.52)
B1	2.571	2.239	2.852	2.824	3.004	3.069	3.218	3.921	3.664	4.813	4.138	3.202	3.529	3.566	4.485
	(22.02)	(18.49)	(24.49)	(30.12)	(24.46)	(37.71)	(35.70)	(39.01)	(35.61)	(45.14)	(43.23)	(30.65)	(28.75)	(31.47)	(47.50)
B2	649.798	198.595	681.539	609.484	744.984	731.370	733.382	708.488	716.305	718.460	752.925	722.932	755.336	1066.546	696.719
	(1037.72)	(585.09)	(1570.19)	(1170.41)	(1476.96)	(1609.63)	(1519.18)	(1408.35)	(1483.70)	(1546.03)	(1681.77)	(1673.03)	(1799.52)	(3084.01)	(1732.07)

[+] Starting from year 2002, the number of observations (N) was not the same for all three variables. The regular bonus variable had a slighter smaller number due to missing observations. The number of observations reported in the table is that of Salary and Non-Regular Bonus.

Figure 1: Changes in Levels of Rolling Average of First and Second Rank Managers: 1994 – 2008

The following graphs displays changes in the rolling average compensation levels among first and second rank managers. A rolling average of a compensation level for a specific year is the average of the compensation level for that year and the two previous years. All values are adjusted for inflation and are in 2009 thousands of Hungarian Forints (HUF).

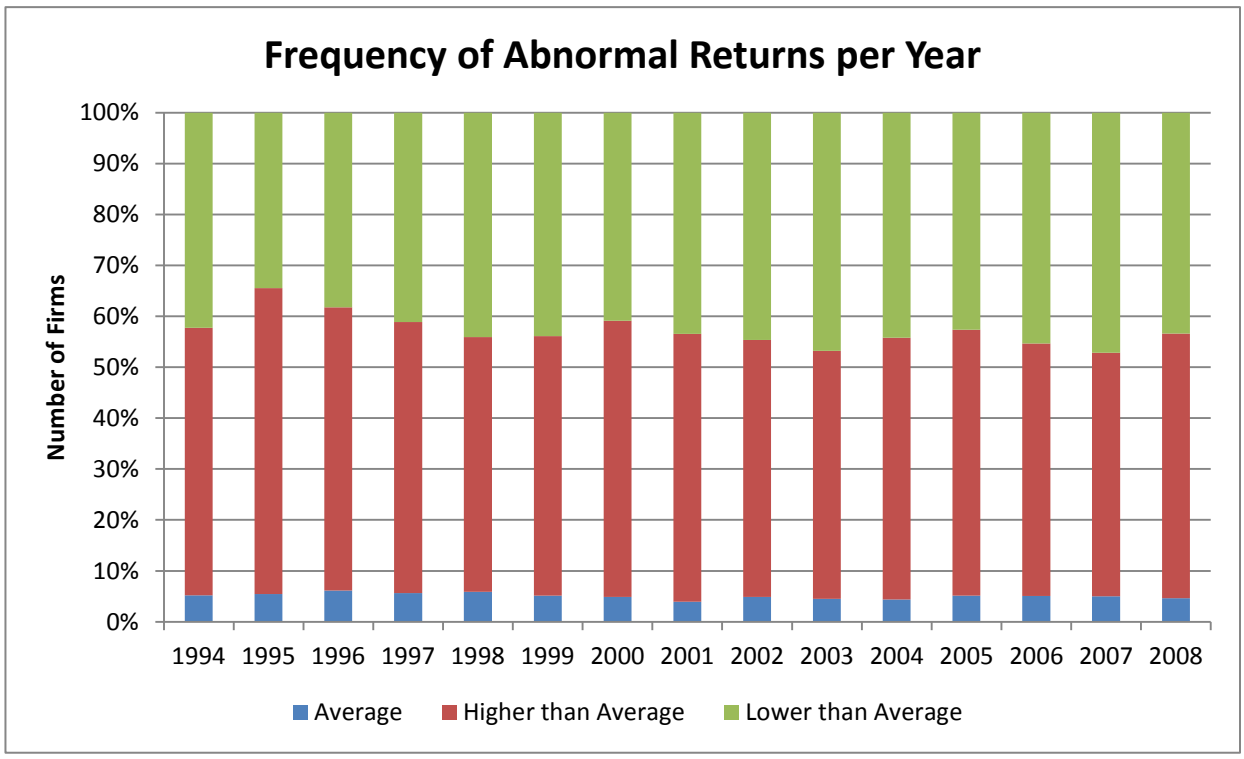




In addition to the above described data and the generated variables, I have also created an industry abnormal return variable. This was calculated by finding the average returns per industry per year, and subtracting it from each firm's individual return. I have also generated variables reflecting the average worker salary per firm excluding managerial salary, and a separate variable capturing the average yearly managerial total compensation level. A frequency chart of the levels of abnormal return per year is presented below:

Figure 2: Changes in Percentage Levels of Abnormal Returns per year: 1994 – 2008

The following graphs displays changes in the percentage levels of abnormal returns for the sampled firms per year. The blue color marks the percentage of firms that registered earning equal to the average returns in their industry at that year. The red color represents the firms that earned higher returns than the industry average that year, and the green color represents the percentage of firms that earned lower than the yearly industry average.



3. Methodology

3.1 Ordinary Least Squares: Motivation and Limitations

Compensation levels for executives can be expected to increase in relation to firms' size, performance, and to vary across industries and across different ownership structures. It is therefore important to understand what explains the differences in managerial salaries. Can differences in levels of executive compensation be attributed to the above factors, or are managers entrenched and exercise private benefits of control? The next step is to therefore analyze the extent to which compensation levels can be explained by firm performance measures, industry effects, and manager characteristics. To this end, I first estimate the following OLS regression for firms in the panel:

$$(1)\quad Log(compensation_{i,t}) = \alpha_0 + \beta_1 female_{i,t} + \beta_2 Secondary_{i,t} + \beta_3 Vocational_{i.t} + \beta_4 University_{i,t} + \beta_5 exp_{i,t} + \beta_6 exp_{i,t}^2 + \beta_7 Log(Sales_{i,t-1}) + \beta_8 Fo_{i,t} + \beta_9 So_{i,t} + \beta_{10} Log(av.m.salary_{i,t}) + \beta_{11}(Log(av.w.salary)_{i,t}) + \beta_{12} Abnormal_{i,t} + \beta_{13}(Abnormal\ x\ Fo)_{i,t} + \beta_{14}(Abnormal\ x\ So)_{i,t} + X_{i,t} + \delta_t + \varepsilon_{i,t}$$

where $female$ is a dummy variable that takes the value of one if the manager in question is a female and zero otherwise. exp and exp^2 aim to capture the positive relationship between compensation and a manager's experience, which I assume increases at a decreasing rate. $Secondary$ is a dummy variable that takes a value of unity if the subject finished secondary school, vocational training, remedial school or vocational secondary school. $Vocational$ reflects whether the subject finished a post-secondary vocational course, and $University$ indicates whether the subject finished college or university. The omitted condition is a dummy capturing subjects that have acquired a primary education level or less. The lagged logarithm of $Sales$ is included to proxy for size, since firms that are larger will naturally be able to afford higher

compensation packages for their managers as opposed to small ones. Barbosa and Louri (2003) and Cho (1998) suggest that ownership structure has a significant effect on firm performance, specifically that on average, foreign owned firms perform better in developing markets while domestic firms perform better in developed countries. To this end, I have included a foreign ownership and state ownership dummies, with private domestically owned firms being the omitted condition. Following Hu and Zhou (2006), I included yearly average managerial salary as a proxy for executive labor market conditions, and also included the average worker salaries per firm excluding managerial salaries, with the intuition being that it would proxy for general labor market conditions. Aggarwal and Samwick (1999) suggest that managers are evaluated according to industry benchmarks, while more recently, Faulkender and Yang (2008) examine the effect of the new regulation in the US of disclosing peer groups, where the firm sets the managerial pay levels taking into account similar compensation packages of companies with similar profiles, i.e. peers.[6] To this end, I generate and include an abnormal returns variable, which is defined as the difference between the individual firm's return, and the average return of that firm's industry. I employ the two digit industry code for this purpose (classifies all firms under 17 industries) and use the lagged logarithm of return on assets as a measure of return: $Log(1 + ROA)$, where ROA is defined as the ratio of pre-tax profit over net total assets of the firm. Furthermore, I include interaction terms of the ownership dummies and abnormal returns in order to determine whether performance according to industry benchmarks is rewarded differently under different firm structures. Moreover, I include the set $X_{i,t}$, utilizing the highly detailed four digit industry codes to account for more industry effects. $X_{i,t}$ also captures industry switchers, which are firms that change their industry classifications during the sample.

[6] The authors stipulate that boards are incentivized to choose peer groups that provide high compensation packages for their executives, so as to justify their own exuberant compensation levels. This is even more true when managers are entrenched or are on the board.

Moreover, following Bebchuk and Grinstein (2005), I also include year dummies δ_t to capture time effects.

In the above discussed first specification (1), the dependent variable is the logarithm of simple salary measured in thousands of forints and converted to 2009 values. However, to fully capture the complete effect on compensation levels, I define compensation as salary plus regular bonus for specification (2) and salary plus regular and non-regular bonus for specification (3). In all other aspects, the independent variables are identical for the three specifications. Furthermore, to isolate the effect on first and second rank managers, I use the three above specifications on a sample with only first rank managers and dub them as specifications 1-3, and then on a sample with only second rank managers and dub them as specifications 4-6. The results are presented in section IV below.

Additionally there is reason to believe that auto-correlation might exist throughout the sample. If a specific firm performs well at a certain year, then it follows that the same firm will also perform well in the coming year. The same applies to executive compensation, since managers who earn high salaries in the past are more likely to earn high salaries in the future. To account for this, I use White-corrected standard errors in the all the specifications throughout the entire analysis.

To recap, specification (1) has simple salary as the dependent variable, specification (2) uses simple salary plus regular bonus as the dependent variable and specification (3) uses simple salary plus regular and non-regular bonus as the dependent variable. Specifications 1-3 are executed on a restricted sample of first rank managers only. For the second step, specification (4) has simple salary as the dependent variable; specification (5) uses simple salary plus regular

bonus as the dependent variable and specification (6) uses simple salary plus regular and non-regular bonus as the dependent variable where in this case, specifications 4-6 are executed on a restricted sample of second rank managers only.

3.2 Fixed Effects: Accounting for Unobserved Heterogeneity and across-firm variation

However, one of the limitations of OLS is that it does not constitute a good fit where there is unobserved heterogeneity between firms in the sample. It is a reasonable assumption to believe that there exist across-firm differences that are not captured by my specification, which leads to omitted variable bias under simple OLS regressions. The solution I propose is to perform a Fixed Effects regression instead. Including firm fixed effects will control for the average differences across firms in any observable or unobservable characteristics, such as the quality of firm output, or the innate ability of workers in the firm, or any other unobservables that may arise. The firm fixed effects coefficients will capture across-firm variation, and retain focus on within-firm variation, greatly reducing the damages of omitted variable bias.

As a next step I utilize the same above described specifications under a Fixed Effects (FE) model. The fixed effect specification will be conducted as follows:

$$(7)\quad Log(compensation_{i,t}) = \alpha_0 + \beta_1 female_{i,t} + \beta_2 Secondary_{i,t} + \beta_3 Vocational_{i,t} + \beta_4 University_{i,t} + \beta_5 exp_{i,t} + \beta_6 exp_{i,t}^2 + \beta_7 Log(Sales_{i,t-1}) + \beta_8 Fo_{i,t} + \beta_9 So_{i,t} + \beta_{10} Log(av.m.salary_{i,t}) + \beta_{11}(Log(av.w.salary)_{i,t}) + \beta_{12} Abnormal_{i,t} + \beta_{13}(Abnormal\ x\ Fo)_{i,t} + \beta_{14}(Abnormal\ x\ So)_{i,t} + X_{i,t} + f_i + \delta_t + \varepsilon_{i,t}$$

In this instance, the above specification is nearly identical to specification (1), but with the addition of f_i as firm fixed effects. Similar to before, specification (7) has simple salary as the dependent variable; specification (8) uses simple salary plus regular bonus as the dependent

variable and specification (9) uses simple salary plus regular and non-regular bonus as the dependent variable. Specifications (7)-(9) are executed on a restricted sample of first rank managers only. For the second step, specification (10) has simple salary as the dependent variable; specification (11) uses simple salary plus regular bonus as the dependent variable and specification (12) uses simple salary plus regular and non-regular bonus as the dependent variable where in this case, specifications (4)-(6) are executed on a restricted sample of second rank managers only. Furthermore, I estimate the same specifications whilst including the non-regular bonus alone as the dependent variable, to see whether the same factors that affect total compensation also affects bonuses. The results of this last specification are reported in the robustness checks section.

4. Results

4.1 Ordinary Least Squares Estimation

Executive compensation levels, which are defined in three different specifications as simple salary, salary plus regular bonus, and salary plus regular and non-regular bonus are estimated according to the above described methods for both first and second rank managers.

Table 4: OLS Estimation Results of Executive Compensation

	Rank 1			Rank 2		
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
C	3.586***	3.558***	1.445***	3.708***	3.751***	1.180***
	(0.123)	(0.126)	(0.206)	(0.057)	(0.065)	(0.114)
Female	-0.058***	-0.055***	-0.021	-0.065***	-0.066***	-0.050***
	(0.009)	(0.009)	(0.015)	(0.004)	(0.004)	(0.007)
Secondary	0.011	0.017	0.055	0.021	0.011	-0.041
	(0.050)	(0.052)	(0.071)	(0.027)	(0.028)	(0.046)
Vocational	0.075	0.082	0.143**	0.102***	0.093***	0.063
	(0.050)	(0.052)	(0.072)	(0.028)	(0.029)	(0.047)
University	0.291***	0.296***	0.420***	0.339***	0.326***	0.345***
	(0.050)	(0.052)	(0.071)	(0.027)	(0.028)	(0.046)
Experience	0.019***	0.020***	0.027***	0.025***	0.025***	0.046***
	(0.002)	(0.002)	(0.003)	(0.001)	(0.001)	(0.001)
$Experience^2$	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000	(0.000	(0.000	(0.000	(0.000
$Log(Sales_{(t-1)})$	0.005***	0.004***	0.004**	0.004***	0.004***	0.003***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Foreign	0.360***	0.355***	0.234***	0.263***	0.260***	0.178***
	(0.014)	(0.014)	(0.020)	(0.006)	(0.006)	(0.009)
State	0.330***	0.351***	0.885***	0.148***	0.150***	0.423***
	(0.014)	(0.015)	(0.028)	(0.006)	(0.006)	(0.012)
Log(av.m.salary)	0.145***	0.149***	0.486***	0.108***	0.111***	0.497***
	(0.017)	(0.018)	(0.029)	(0.009)	(0.009)	(0.016)
Log(av.w.salary)	0.971***	0.983***	1.313**	0.748***	0.753***	1.049***
	(0.010)	(0.010)	(0.014)	(0.006)	(0.006)	(0.009)
Abnormal	0.002	0.001	-0.013	0.007	0.008	0.001
	(0.018)	(0.018)	(0.027)	(0.012)	(0.013)	(0.020)
Abnormal x Foreign	0.047	0.053	0.085	-0.020	-0.019	0.011
	(0.052)	(0.053)	(0.074)	(0.021)	(0.022)	(0.033)
Abnormal x State	0.018	-0.004	-0.025	0.010	0.007	0.074*
	(0.039)	(0.045)	(0.109)	(0.022)	(0.023)	(0.041)
Observations	**29,936**	**29,225**	**29,225**	**69,322**	**68,434**	**68,434**
Adjusted R^2	**0.59**	**0.59**	**0.53**	**0.58**	**0.58**	**0.49**
Time Effects			**Yes**			
Industry Effects			**Yes**			

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

The above reported estimation results show that executive compensation levels for both first and second rank managers behave as expected for the gender status and human capital measures. For the highest form of compensation (salary plus regular and non-regular bonus) females in the sample earn on average 2.1% less if they are a first rank manager and 5% less if they are a second rank manager, where estimation results for this coefficient are significant at the 1% level at all specifications. Levels of education and experience also behave as expected. The most significant education effect takes place at University level of education, where at the highest level of compensation, a university education increases a manager's compensation by 42% and 34.5% for first and second rank managers respectively. Vocational training also displays positive effects. It is worth noting however, that this should be interpreted carefully, as most managers do indeed have university levels of education, compared to primary education (the omitted category, and hence what the categorical dummies are compared against).[7] Experience in this case seems to not suffer from decreasing returns. While the exp^2 variable is significant, it is not significantly different from zero, even though the coefficient is multiplied by 100 for ease of interpretation, which means that executive compensation levels in Hungary have a positive relation to experience, but do not follow the trend of increasing at a decreasing rate.

Using the net Sales from the preceding year as a proxy for size, estimation results show that the average manager's compensation level in this sample is not affected by firm size (coefficients range from 0.003% – 0.005%). This offers the interesting interpretation that both first and second rank managers do not command higher compensation levels in larger firms compared to smaller ones.

[7] See table 2 in the data section for more details.

Using $Log(av.w.salary)$ to proxy for general labor market conditions and more specifically average manager salary per year ($av.m.salary$) to proxy for manager labor market conditions (Hu and Zhou (2006)), I find that there is a small but significant effect to these variables. On average, a 1% increase in the average worker salary per firm corresponds to around a 1.3% and 1.1% increase in the highest level of executive compensation in the sample for first and second rank managers respectively. On the other hand, a 1% increase in the sampled average managerial wage per year corresponds to around 0.5% increase in the highest level of executive compensation in the sample for first and second rank managers respectively.

However, the above OLS estimation results also reveal that the biggest determinant of executive compensation levels is the firm's ownership. On average first and second rank managers in private foreign owned firms earn 23.4% and 17.8% more than their counterparts in private domestic firms, while first and second rank managers in state owned firms earn 88.5% and 42.3% more than their counterparts in private domestic firms. While the pattern here is consistent with the literature concerning similarly ranked European countries (Barbosa and Louri 2003, Farinos et al (2006) and Claessens et al (1997))[8], the magnitude of the coefficients seems implausibly high, which is one of the reason I opted to use a fixed effects estimation and to opt and correct for unobserved across-firm variation and omitted variable bias that probably inflate these OLS estimates.

Another interesting result is that which is drawn from the coefficients on abnormal returns, which are insignificant across all levels of compensation for both manager ranks. This indicates that Hungarian manager are not evaluated based on the firm's performance relative to

[8] Barbosa and Louri analyze the effect of ownership type on firm performance for Greece and Portugal. Farinos et al does a similar analysis using Spanish firms, and Claessens et al conducts a similar investigation in the Czech Republic.

that industry on which the firm is in.[9] Moreover, the interaction terms between the ownership type dummies reveals that manager are not evaluated based on performance compared to industry benchmarks regardless of the type of firm ownership.

4.2 Fixed Effects Estimation

To account for unobserved heterogeneity, as well as average differences across firms in any observable or unobservable characteristics, such as the quality of firm output, or the innate ability of workers in the firm, or other unobservable that may arise, I utilize the fixed effects estimation reported below and shown overleaf:

[9] I used Return on Assets (defined as pre-tax profit over net total assets) to measure performance of both individual firms and industry averages.

Table 5: FE Estimation Results of Executive Compensation

	Rank 1			Rank 2		
Variable	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
C	5.109***	5.077***	3.242***	4.621***	4.616***	2.393***
	(0.145)	(0.151)	(0.290)	(0.071)	(0.073)	(0.138)
Female	-0.075***	-0.072***	-0.071***	-0.080***	-0.081***	-0.079***
	(0.013)	(0.013)	(0.021)	(0.004)	(0.005)	(0.008)
Secondary	-0.043	-0.043	-0.041	0.024	0.019	0.011
	(0.059)	(0.060)	(0.097)	(0.027)	(0.027)	(0.046)
Vocational	-0.024	-0.020	0.014	0.094***	0.088***	0.098**
	(0.061)	(0.062)	(0.100)	(0.027)	(0.028)	(0.047)
University	0.041	0.041	0.060	0.289***	0.284***	0.312***
	(0.060)	(0.061)	(0.099)	(0.027)	(0.027)	(0.046)
Experience	0.029***	0.029***	0.042***	0.025***	0.026***	0.040***
	(0.003)	(0.003)	(0.004)	(0.001)	(0.001)	(0.002)
$Experience^2$	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Log(Sales_{(t-1)})$	-0.001	-0.001	-0.002	0.001*	0.001*	0.000
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Foreign	0.080**	0.079**	0.023	0.074***	0.073***	0.154***
	(0.037)	(0.038)	(0.067)	(0.012)	(0.012)	(0.020)
State	-0.040	-0.036	0.089	-0.001	-0.004	0.064***
	(0.045)	(0.045)	(0.090)	(0.012)	(0.012)	(0.022)
Log(av.m.salary)	0.046**	0.050***	0.357***	0.076***	0.078***	0.440***
	(0.018)	(0.019)	(0.036)	(0.009)	(0.009)	(0.017)
Log(av.w.salary)	0.571***	0.433***	0.931**	0.484***	0.435***	0.894***
	(0.009)	(0.010)	(0.014)	(0.006)	(0.006)	(0.009)
Abnormal	-0.002	-0.002	0.003	-0.002	-0.005	-0.016
	(0.018)	(0.018)	(0.033)	(0.010)	(0.011)	(0.018)
Abnormal x Foreign	-0.003	-0.003	0.031	0.000	0.006	0.025
	(0.045)	(0.045)	(0.068)	(0.018)	(0.019)	(0.029)
Abnormal x State	0.036	0.049	-0.075	0.013	0.017	0.072*
	(0.030)	(0.037)	(0.091)	(0.019)	(0.020)	(0.041)
Observations	**29,936**	**29,225**	**29,225**	**69,322**	**68,434**	**68,434**
Adjusted R^2	**0.85**	**0.85**	**0.79**	**0.76**	**0.75**	**0.70**
Firm Fixed Effects			**Yes**			
Time Effects			**Yes**			
Industry Effects			**Yes**			

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Similar to the OLS results before, the gender status and human capital measures behave in the expected manner. When defining compensation as salary plus regular and non-regular bonus, first rank female managers earn on average 7.1% less than their male counterparts, while second rank female managers earn 7.9% less. Note that these values are significant at the 1%

level and somewhat higher than those obtained through the OLS estimation. The coefficients on education dummies remain significant at the highest level but only for second rank managers, who earn a 31.2% estimated increase in the highest level of compensation compared to the omitted condition of primary education. The level of experience also shows a similar effect to the OLS results, where on average, an increase of one year of experience corresponds to a 4.2% and a 4% increase in the highest level of compensation for first and second rank managers respectively. Similar to the OLS results, $experience^2$ also seems to have no significant effect.

The lagged logarithm of sales, used as a proxy for size, losses its significance under Fixed Effects compared to the previous OLS result. This however, does not affect the proposed interpretation, since under OLS, the coefficient was not statistically different from zero. Under both OLS and the Fixed Effects estimations, the size of the firm seems to hold no effect on manager compensation regardless of manager rank.

Also similar to the OLS estimation, the average worker salary per firm (proxy for general labor market conditions) and average yearly manager salary (proxy for manager labor market conditions) remain significant but decrease in magnitude. At the highest level of compensation, estimation results show that on average, a 1% increase in the average worker salary per firm corresponds to around a 0.9% increase in the highest level of executive compensation in the sample for both first and second rank managers. On the other hand, a 1% increase in the sampled average managerial wage per year corresponds to a 0.3% and 0.4% % increase in the highest level of executive compensation in the sample for first and second rank managers respectively.

As in the previous OLS estimation, the Fixed Effects estimates on abnormal returns and its interactions with the ownership dummies show that managers are not evaluated on the firms'

performance relative to industry benchmarks regardless of the ownership of the firm, except for the highest compensation level of second rank managers at the state level. The coefficient indicates an increase of 7.2% for second rank managers working at a state firm who manage to secure a 1% increase in return above the industry average. Nevertheless, this relation remains tenuous as the result is only significant at the 10% level.

Perhaps the most notable difference in the new Fixed Effects estimates and the OLS estimates concerns the ownership dummies. The dummy indicating state ownership loses significance at all points except at the highest level of compensation for second rank managers, where it shows that compensation defined as simple salary plus regular and non-regular bonus is 6.4% higher for second rank managers in state owned firms, compared to private domestic owned firms. The foreign ownership dummy loses some significance, but only for first rank managers at the highest level of compensation[10], as it still shows that second rank managers earn 7.4%, 7.3% and 16.4% more than their counter parts at private domestic firms for the three levels of compensation respectively.

In general, while the estimate of the Fixed Effects specifications match those of the OLS in their sign, all variables have decreased in magnitude and some have even lost some statistical significance. This is to be expected due to the nature of the Fixed Effects estimation method. Including firm Fixed Effects in the regression will account for observable and non-observable across-firm variation, and reduce omitted variable bias. Before including a Fixed Effects specification, these factors would have biased the OLS estimates upwards, meaning that the

[10] First rank managers at foreign owned firms still earn 8% more in simple salary than their counterpart at private domestic firms

Fixed Effects estimates can be considered as more reliable estimates in examining executive compensation levels.

In both the OLS and the Fixed Effects estimates, the same picture can be presented. Outside of the expected way in which gender status and human capital affects earnings, there is little else besides firm ownership that can explain deviations in salaries of Hungarian managers. While both first and second rank managers who work at state firms or foreign owned firms earn more than their counterparts in private domestic firms, other firm characteristics fail to explain executive compensation. Managerial salaries at all measures for both first and second rank managers are not affected by firm size. Moreover, abnormal return of a firm also has little to no effect. This means that Hungarian managers are not evaluated according to how the firm performs according to industry benchmarks. After accounting for fixed effects methods, this raises the interesting implication that there are other unobserved within-firm factors that affect a manager's salary. Although the ownership type of the firm does affect the compensation level, this still raises questions about managerial entrenchment among the observed Hungarian firms, since executive compensation levels for both ranks of managers seem to be unaffected by a firm's size or performance measures regardless of ownership.

4.3 Robustness Checks

First, I aim to use the number of employees in a firm instead of the lagged logarithm of sales to capture the size effect. In un-tabulated results, all OLS and fixed effects specification show very little to no change in the estimated coefficients' magnitude or significance levels, which indicates that the specifications used are robust to both measures of firm size.

Second, I aim to investigate the robustness of my results to an alternative industry performance measure. Instead of using Return on Assets as the performance measure in measuring abnormal returns, I use Revenue per Employee (RPE), defined as total revenue, or sales, divided by the number of employees in each firm. The reasoning behind this approach stems from an accounting standpoint, where Return on Assets satisfies a financial measure of performance, while Revenue per Employee satisfies an operative level of performance. The two measures reflect different aspects of a firm's performance, since one firm could easily report a negative return on assets – due to negative profits – but still maintain a good level of RPE if it holds a large volume of sales.

Repeating the estimations using RPE as a measure of performance in evaluating abnormal returns and its interaction with ownership dummies reveals that the estimations results change very little with respect to both the OLS and Fixed Effects specifications. Under OLS, the abnormal returns coefficients are significant but negligibly small, and this significance disappears under the Fixed Effects estimation. The OLS results also show that second rank managers working at state owned firms will earn less than around 1% more than their counterparts at private domestic firms, and this too loses significance with the Fixed Effects estimation. All other coefficients behave in the same manner and are similar in magnitude as when abnormal returns were measured using ROA as a measure of performance. The results of the above described robustness checks are reported in tables 8 and 9 in the appendix.

Finally, I aim to investigate the robustness of the used specification in explaining bonuses only. The motivation arises from the fact that while salaries can be contractually fixed, bonuses – especially irregular ones – follow more leeway. Table 5 in the appendix section represents the same specifications used before, while using non-regular bonus as the dependent variable. The

estimated values follow very closely to those of the main specifications both at the OLS and the Fixed Effects methods. This indicates that the same factors that affect executive compensation also affect non-regular bonuses in the same way.

4.4 Extensions and Future Directions of Research

The fact that executive compensation is not affected by measures of firm size and firm performance raises the question of managerial entrenchment. If a manager's salary is not affected by how well a firm does, or by its size, then one would be forgiven to suspect that the manager is not being evaluated according to the best interest of the shareholders. However, more research needs to be conducted to fully understand how Hungarian executive compensation is determined. For instance, due to the nature of this data set, where firms are sampled randomly throughout the sample, it is not possible to measure increases in managerial salaries throughout the year a la Bebchuck and Grinstein (2005), who are able to measure growth in compensation by following the managers throughout the years. Additionally, there are other forms of executive compensation that are not discussed in this study, most notably equity based compensation. While Hungarian firms do not offer stock options, managers can still be compensated through equity, which sometimes comprises a large part of total compensation, especially for high rank managers. Other forms of compensation not captured by this data set, and by extension, this study are information about contribution to executives' pension plans. While it is true that this problem is recurrent in the literature, since firms are not obligated to divulge information about their pension plans, Bebchuck and Fried (2004) note that using pension plans as a form of compensation is used by companies as a camouflage to disguise the true nature of the executive compensation environment.

5. Conclusion

In this paper, I attempted to shed light on executive compensation in Hungary in the 1994-2008 periods. After dividing the managers into first and second rank managers, and through observing their wages, regular bonuses, and non-regular bonuses in addition to other demographic variables and firm information, I set forth to observe whether executive compensation can be explained accordingly, or whether there exist hints of managerial entrenchment.

Using Ordinary Least Squares and Fixed Effects methods encompassing different levels of compensation and both ranks of managers, I find that gender status and human capital measures such as education and experience affect all levels of compensation for both ranks of managers in the expected way. Female managers on average earn less that male managers, and more experienced and educated managers on average earn more than less educated and less experienced managers regardless of rank or form of compensation. Moreover, type of ownership seems to play a sizable role in affecting executive compensation, where both ranks of managers working at state or private foreign firms earn significantly higher wages than their counterparts at private domestic firms. The magnitude of this effect decreases under the Fixed Effects specifications but remain statistically significant especially for foreign owned firms.

Interestingly, executive compensation in Hungary seems to not be affected by measures of firm size, or firm performance, defined as the abnormal returns, or the returns each firm acquires relative to the average returns in that particular industry. Additionally, by interacting abnormal returns with ownership type dummies, I find that executive compensation is not affected by firm performance regardless of ownership type and regardless of manager rank. I investigated different robustness checks, and found that these results are robust to different measures of firm

size and performance under both OLS and Fixed Effects estimation methods, as well as restricting the regressions to explain bonuses only as opposed to total compensation. Nevertheless, Future research needs to be conducted to fully understand the determinates and factors affecting executive compensation in Hungary, most notably dealing with other forms of compensation such as equity pay, pension plans, and severance packages.

It is true that the nature of executive compensation in Hungary cannot be fully accounted for through this study. Nevertheless, I hope that by determining that the forms of compensation used in this paper are not affected by common measures of firm size and performance, but only by gender status, human capital measures, and ownership type will at least raise some questions as to what truly affects executive compensation, and whether Hungarian managers are at some level, entrenched and enjoying private benefits of control.

Appendix

Table 6: Estimates using Non-Regular Bonus as a Dependent Variable

	OLS		FE	
	Rank 1	**Rank 2**	**Rank 1**	**Rank 2**
Variable	**(1)**	**(2)**	**(3)**	**(4)**
C	-1.927***	-1.035***	2.470***	0.325
	(0.509)	(0.215)	(0.731)	(0.331)
Female	-0.101***	-0.098***	-0.130**	-0.099***
	(0.034)	(0.013)	(0.058)	(0.015)
Secondary	0.315	-0.055	-0.409	-0.050
	(0.297)	(0.096)	(0.280)	(0.093)
Vocational	0.387	0.151	-0.319	0.069
	(0.298)	(0.098)	(0.291)	(0.095)
University	0.805***	0.562***	-0.194	0.375***
	(0.295)	(0.096)	(0.283)	(0.094)
Experience	0.047***	0.063***	0.041***	0.056***
	(0.008)	(0.003)	(0.011)	(0.003)
$Experience^2$	-0.000***	-0.000***	-0.000**	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
$Log(Sales_{(t-1)})$	0.010*	-0.000	0.006	0.001
	(0.005)	(0.002)	(0.005)	(0.002)
Foreign	0.147***	0.064***	0.316**	0.048
	(0.041)	(0.016)	(0.128)	(0.033)
State	0.408***	0.198***	0.149	0.158***
	(0.040)	(0.019)	(0.119)	(0.037)
Log(av.m.salary)	0.914***	0.780***	0.652***	0.687***
	(0.061)	(0.029)	(0.079)	(0.031)
Log(av.w.salary)	0.861***	0.868***	0.725***	0.711***
	(0.034)	(0.017)	(0.010)	(0.009)
Abnormal	-0.016	0.003	0.068	-0.007
	(0.054)	(0.043)	(0.074)	(0.040)
Abnormal x Foreign	0.058	-0.031	-0.151	-0.046
	(0.143)	(0.069)	(0.170)	(0.064)
Abnormal x State	0.034	0.165**	-0.095	0.066
	(0.120)	(0.076)	(0.115)	(0.074)
Observations	**29,225**	**68,434**	**29,225**	**68,434**
Adjusted R^2	**0.44**	**0.49**	**0.74**	**0.67**
Firm Fixed Effects	**No**	**No**	**Yes**	**Yes**
Time Effects	**Yes**			
Industry Effects	**Yes**			

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table 7: 1993 Hungarian Standard Classifications of Occupations

Rank	Codes and Definitions	Freq.	Perc.
Rank 1	1311 General managers of business organisations (directors, executive managers)	30,670	5.76
	1312 General managers of budgetary institutions	2	2.07
Rank 2	1321 Department managers in agriculture and forestry	1,803	7.68
	1322 Department managers in manufacturing	5,856	0.75
	1323 Department managers in construction	2,102	2.4
	1324 Department managers in wholesale and retail trade	7,806	0.31
	1325 Department managers of restaurants and hotels	764	0.63
	1326 Department managers in transport, forwarding and storage	2,438	3.61
	1327 Department managers in communications and postal services	318	0.23
	1328 Department managers in water supply and communal services	641	0.51
	1331 Department managers in business services	3,668	0.48
	1332 Department managers in personal care and cleaning services	236	0.44
	1333 Department managers in health care and welfare services	518	2.88
	1334 Department managers in education	484	3.33
	1335 Department managers in cultural services	448	15.27
	1339 Department managers in production and services n.e.c.	2,924	2.37
	1341 Marketing managers	3,384	0.49
	1342 Accountancy and finance managers	15,521	1.6
	1343 Human resources (personnel) managers	2,412	7.29
	1344 Advertising and other public relations managers	496	2.22
	1345 Supply and distribution managers	1,629	0.9
	1346 Technical managers	7,410	6.85
	1347 Computing services managers	2,254	5.76
	1348 Research and development managers	914	2.07
	1349 Functional unit managers n.e.c.	6,964	7.68
	Total	101,662	100

Table 8: OLS Estimation Results of Executive Compensation using RPE in measuring abnormal returns

	Rank 1			Rank 2		
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
C	3.572*** (0.123)	3.543*** (0.127)	1.420*** (0.206)	3.687*** (0.058)	3.730*** (0.065)	1.157*** (0.114)
Female	-0.058*** (0.009)	-0.055*** (0.009)	-0.021 (0.015)	-0.065*** (0.004)	-0.066*** (0.004)	-0.050*** (0.007)
Secondary	0.012 (0.050)	0.018 (0.052)	0.057 (0.071)	0.022 (0.027)	0.011 (0.028)	-0.041 (0.046)
Vocational	0.076 (0.050)	0.083 (0.052)	0.144** (0.072)	0.102*** (0.028)	0.093*** (0.029)	0.063 (0.047)
University	0.292*** (0.050)	0.296*** (0.052)	0.421*** (0.071)	0.339*** (0.027)	0.326*** (0.028)	0.345*** (0.046)
Experience	0.019*** (0.002)	0.020*** (0.002)	0.027*** (0.003)	0.025*** (0.001)	0.025*** (0.001)	0.046*** (0.001)
$Experience^2$	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
$Log(Sales_{(t-1)})$	0.006*** (0.002)	0.005*** (0.002)	0.006** (0.002)	0.006*** (0.001)	0.005*** (0.001)	0.005*** (0.001)
Foreign	0.360*** (0.014)	0.355*** (0.014)	0.233*** (0.020)	0.262*** (0.006)	0.260*** (0.006)	0.178*** (0.009)
State	0.329*** (0.014)	0.352*** (0.015)	0.884*** (0.028)	0.147*** (0.006)	0.149*** (0.006)	0.423*** (0.012)
Log(av.m.salary)	0.146*** (0.017)	0.149*** (0.018)	0.486*** (0.029)	0.108*** (0.009)	0.111*** (0.009)	0.497*** (0.016)
Log(av.w.salary)	0.971*** (0.010)	0.983*** (0.010)	1.314*** (0.014)	0.749*** (0.006)	0.754*** (0.006)	1.050*** (0.009)
Abnormal	-0.004 (0.003)	-0.003 (0.003)	-0.008 (0.006)	-0.009*** (0.002)	-0.009*** (0.002)	-0.009** (0.004)
Abnormal x Foreign	-0.001 (0.009)	0.000 (0.009)	0.000 (0.013)	0.001 (0.003)	0.001 (0.003)	-0.005 (0.006)
Abnormal x State	0.002 (0.009)	-0.014 (0.010)	0.017 (0.020)	0.013*** (0.004)	0.013*** (0.004)	0.030*** (0.008)
Observations	**29,936**	**29,225**	**29,225**	**69,322**	**68,434**	**68,434**
Adjusted R^2	**0.59**	**0.59**	**0.53**	**0.58**	**0.58**	**0.49**
Time Effects			**Yes**			
Industry Effects			**Yes**			

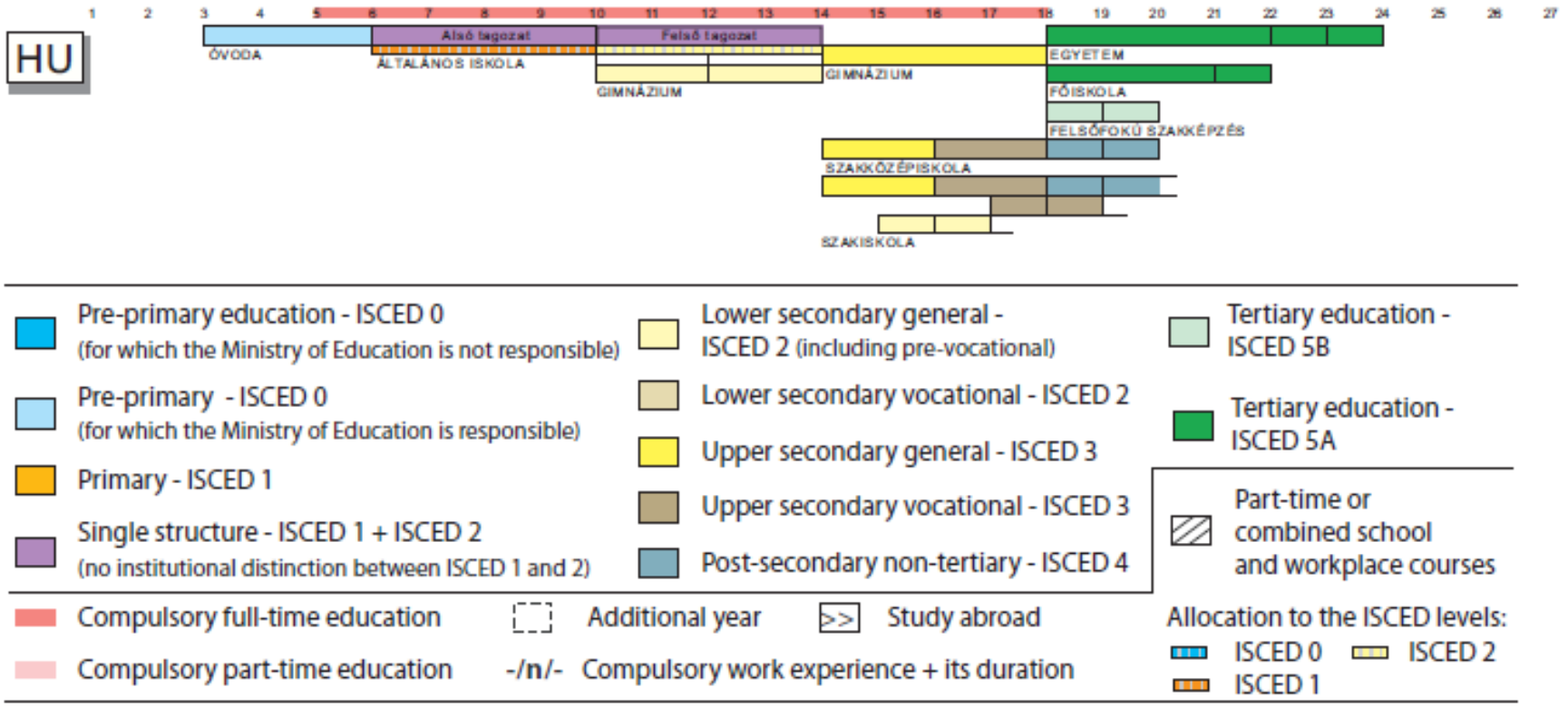
* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table 9: FE Estimation Results of Executive Compensation using RPE in measuring abnormal returns

	Rank 1			Rank 2		
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
C	5.122*** (0.145)	5.090*** (0.151)	3.259*** (0.291)	4.619*** (0.071)	4.615*** (0.073)	2.379*** (0.139)
Female	-0.075*** (0.013)	-0.072*** (0.013)	-0.071*** (0.021)	-0.080*** (0.004)	-0.081*** (0.005)	-0.079*** (0.008)
Secondary	-0.043 (0.059)	-0.044 (0.060)	-0.041 (0.097)	0.024 (0.027)	0.019 (0.027)	0.010 (0.046)
Vocational	-0.024 (0.061)	-0.021 (0.062)	0.014 (0.100)	0.094*** (0.027)	0.089*** (0.028)	0.098** (0.047)
University	0.040 (0.060)	0.041 (0.062)	0.060 (0.099)	0.289*** (0.027)	0.284*** (0.027)	0.312*** (0.046)
Experience	0.029*** (0.003)	0.029*** (0.003)	0.042*** (0.004)	0.025*** (0.001)	0.026*** (0.001)	0.040*** (0.002)
$Experience^2$	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
$Log(Sales_{(t-1)})$	-0.001 (0.001)	-0.001 (0.001)	-0.002 (0.002)	0.001* (0.001)	0.001* (0.001)	0.001 (0.001)
Foreign	0.079** (0.037)	0.079** (0.038)	0.021 (0.067)	0.074*** (0.012)	0.073*** (0.012)	0.154*** (0.020)
State	-0.041 (0.045)	-0.037 (0.045)	0.083 (0.090)	-0.001 (0.012)	-0.005 (0.012)	0.064*** (0.022)
Log(av.m.salary)	0.045** (0.018)	0.050*** (0.019)	0.356*** (0.036)	0.076*** (0.009)	0.078*** (0.009)	0.440*** (0.017)
Log(av.m.salary)–Log(w.salary)	0.573*** (0.034)	0.568*** (0.033)	1.022*** (0.057)	0.442*** (0.015)	0.431*** (0.015)	1.004*** (0.027)
Abnormal	0.002 (0.003)	0.001 (0.003)	-0.003 (0.005)	-0.002 (0.002)	-0.002 (0.002)	-0.004 (0.003)
Abnormal x Foreign	0.003 (0.008)	0.004 (0.008)	0.013 (0.012)	0.003 (0.003)	0.003 (0.003)	-0.004 (0.005)
Abnormal x State	0.010 (0.008)	0.010 (0.010)	0.043** (0.020)	0.005 (0.004)	0.005 (0.004)	0.010 (0.007)
Observations	**29,936**	**29,225**	**29,225**	**69,322**	**68,434**	**68,434**
Adjusted R^2	**0.85**	**0.85**	**0.79**	**0.76**	**0.75**	**0.70**
Firm Fixed Effects	**Yes**					
Time Effects	**Yes**					
Industry Effects	**Yes**					

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Figure 3 Organisation of the education system in Hungary, 2003/04



Source: Eurydice.

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