LABOR DISCRIMINATION AND FEMALE LEADERSHIP – EVIDENCE FROM HUNGARY

By

Marina Sokolova

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Supervisor: Professor Álmos Telegdy

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Abstract

This thesis analyzes the effect of female leadership on the wages and workplace discrimination in form of wage gaps in Hungary. I find that employees who work in companies where Chief Executive Officer (CEO) is a female tend to have higher wages compared to the firms with male CEOs. These results are robust to the number of specifications when the worker-level fixed effects are included and the firm-level characteristics like industry dummies or dummies for public and private ownership are controlled for. The analysis of the dynamics for the firms who switched from male to female CEO suggests that the positive effect on wages starts from the third year since the change occurred and confirms the findings of the baseline model. As an extension, I also test how female CEOs impact the overall number of females in the company and find a positive effect both for the dynamics specification and baseline results.

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Introduction

There is a growing interest worldwide in topics of gender and racial equality. More diversity may bring new ideas and stable growth both in corporate and public sector. For example, companies who have more diverse boards experience higher return on assets (Erhardt, et al. (2003)). This can be explained in several ways: first, greater diversity (not just gender, but racial as well) allows to present different views and ideas which may lower so called "confirmation bias", a type of cognitive bias where people favor evidence supporting their initial beliefs. If not dealt with, confirmation bias leads to overconfidence which affects a company's strategy and thus, financial performance. In the case, there is discrimination in a company, talented women cannot realize their potential, which eventually lowers firm's performance as it does not effectively use its talent pool (IMF, 2013).

Better representation at the upper level can help to understand gender-specific problems, like better policies regarding maternity leave, childcare benefits, or work schedule flexibility, factors often holding females back from ambitious career goals. Another advantage overcoming the glass ceiling is the possibility of mentoring and overall motivation for female employees.

In my project, I analyze how female leadership, specifically, female CEOs, can impact the governance and Human Resources (HR) policies – overall wages and wage gaps between males and females in the company. I also study how the presence of the female CEO impacts the overall number of female workers in the firm. To overcome the selection bias, I analyze the dynamics specification for the firms which switched from male to female CEO and its effect on wages of the employees and the number of female workers.

The representation of females in top management remains at a rather low level: there were only 14.9% females among CEOs, executives and non-executives in the largest publicly listed

companies across EU countries in 2016.¹ In Hungary, this indicator is even less – women account for only 11.1% of executive positions in the largest publicly listed companies.

How can we explain this? Women might be less competitive than men and more prone to cooperative behavior while in the corporate world such a quality might be seen as weakness in the individual competition for high-ranked positions. On the other hand, society's perception of successful women is different from the views on men's: career and family are often viewed as contradictory, while the perception of women's success may often be family-related. Therefore, society and public opinion would discourage women from aiming for high-ranked posts. Another theory that might explain the existing evidence is connected to the work-life balance: women might value career prospects less if it leads to a lot of overtime spent in the office. Maternity leave also negatively affects career aspirations: after two or three years on leave females lose some of the qualifications and have to quickly catch up with tasks and office routine. Thus, it takes additional time to "get back in the game" while males are not affected that much by the birth of a child.

Another explanation is related to the "glass ceiling" concept. Women might not be promoted to high-ranked positions due to gender discrimination (implicit or not), even when having equal or better skills than males. Or they can reach high-ranked positions only in typical "female" jobs: HR, accounting, Public Relations (PR) – everything that requires either monotonous work or communication skills. Meanwhile, positions like CEO, Chief Strategy Officer, Chief Financial Officer (CFO) are usually male-dominated.

Better representation of females in the top positions may help with gender discrimination in the workplace. Female leadership may decrease the wage gap in the company and help to

¹ European Institute for Gender Equality Gender Statistics database. Available at: <u>http://eige.europa.eu/gender-</u> statistics/dgs/indicator/wmidm_bus_bus_wmid_comp_compex

overcome the "glass ceiling". The example of female CEO may motivate other female employees to aim for executive positions thus causing spillover effects.

On the other hand, it is possible that firms with high-ranked female executives would have higher wage gaps and less females in the firm due to so-called "Queen Bee Syndrome", a concept which was first introduced by Staines et al. (1974). While they are made to compete in a male-dominated environment, females who have reached the top of their profession can discriminate their female colleagues on a larger extent, decreasing their chances of success. (Bagues et. al. (2014))

Most of the existing literature is focused on the western world while the research on developing economies is limited due to data restrictions. Central Europe remains a bridge between developed and yet developing economies providing an opportunity for the new findings which are different from the existing ones. In my thesis, I focus on Hungary, where I analyze the impact of female CEOs on companies' wage policies. I not only examine how the presence of CEO affects the overall wages and wage gaps but also show how the wages change if the firm switches from male to female CEO. As most of the previous research is concentrated on developed economies (and yet still with ambiguous outcomes), it is important to show the picture for the developing and post-transition countries where gender equality topics are yet to be the center of political and economic discussion.

I find that female CEOs have a positive significant effect on the wages of all employees (around 5%), which is robust to the addition of firm-level controls. I also find that female CEOs are positively affecting the number of females working in the company, and the findings are robust in the extended specifications. However, female CEOs start affecting the firm policies not immediately: their impact becomes pronounced from the second and the third year after the company switched to female CEO. The results suggest that the wage gap

still remains for the female-led firms although it is effect decreases between the second and the third year after the female CEO was elected by the firm.

The paper is organized as follows: I start with the literature review and hypothesis, then I describe the data and descriptive statistics used in this project. Then I continue with the empirical strategy and the produced outcomes of the study. Finally, I draw a conclusion and suggestions for future research.

Literature review and hypothesis

Existing literature

Differences in organizational behavior between males and females have been a popular topic for researchers. Dohmen et. al. (2011) show that the willingness to take risks would be higher between males than females in general, while Croson and Gneezy (2009) find that women are more prone to cooperation rather than competition.

Gender-specific issues and family planning can be also a barrier for women from reaching top positions in corporate world. Bertrand, Goldin and Katz (2010) analyzed the career dynamics of the graduates of Chicago Booth business school and showed that women with children have the largest differences in wages or labor force participation compared to their male counterparts. This suggests that maternity leave and any gaps in the career have an adverse effect on future prospects. Reproductive health may have also contributed to the decrease in gender gap – Bailey et al (2012) find that the invention and broad popularity of "The Pill" had a positive effect on wage gaps as it allowed women have more thoughtful family-planning and therefore, focus on the career and to invest more in human capital without undesired childbirth break.

Aside from different risk-taking attitudes, there are differences in HR policies. Matsa and Miller (2013) show that there were changes in the corporate governance style of the firms affected by the board quota in Norway: they had fewer layoffs which decreased companies' profits. Aside from changed HR-management practices they did not document any significant changes in companies' strategies that can affect profitability. Another feature of female leadership would be a decrease in overall discrimination at the work place. Lucifora and Vigandi (2016) investigate the effect of female leadership and find a pattern of "women helping women" in the case of female leadership in companies. Different HR practices between males and females are also confirmed by another research by Matsa and Miller

(2013), who, using the firm-level data for the period of Great Depression found that femaleled firms were less likely to do job cuts.

Existing research shows significant differences in corporate behavior and the strategy of the company between males and females. Levi, Li, and Zhang (2014) find that the increase in the number of women in the corporate board leads to a decrease of the bid price of the transaction and the number of deals. They also show that there is also a negative relation between R&D spending and capital expenditures. In their previous paper Levi, Li, and Zhang (2010) show that testosterone level may be to blame for the increased activity on the Mergers and Acquisitions (M&A) markets: younger CEOs tend to organize more deals compared to older ones potentially due to a dominance seeking attitude.

The large part of literature is dedicated to female governance and its effect on the company performance. Using data on the athletics directors in the U.S. Bednar and Gicheva (2014) find that gender and "female-friendliness" are not directly linked. However, the results of Matsa and Miller (2011) show a different picture. Their analysis of the board structures in the U.S. corporate sector demonstrate that larger female representation in the boards leads on average to more female top-managers in the company – a so-called "women helping women" pattern. According to Bell (2005), having female CEO's and Board Chair would lead to the increase both in the number of female executives and their wages.

Existing research acknowledges the effect of female managers on wages and gender gaps. Using the data on Portuguese firms, Cardoso and Winter-Ebmer (2010) find that in female-led firms there is a reduction of the gender gap by 1.5% and a decrease of the overall wages for both males and females. Flabbi et al. (2016) showed that female executives tend to reduce wage gap within the top of the wage distribution while it is increased at the bottom. Their results also suggest that a company's productivity increases with the higher number of female workers. Their theoretical framework suggests that female CEOs are better at reading the information regarding female workers' productivity and thus, appoint wages more precisely describing the individual productivity of females. In contrast, Gagliarducci and Paserman (2015) find a negative relationship between gender diversity and various firms' indicators, such as turnover, investment per worker or part-time employment.

Hypothesis

As described in the previous section, there are documented differences between males and females in their strategy regarding company's HR policies. Female CEOs may positively affect wages of the employees and also the hiring or firing practices. It may be partially explained by their effect on wage gaps and decrease of labor discrimination in the company. The explanation can be the following: the impact of female CEOs on wage discrimination may be positive due to "women-helping-women" pattern. Thus, they would promote and hire more female workers and assign them higher wages. Alternatively, it is possible, that the presence of female CEO motivates more females to apply for positions in this company. Another possible explanation is that women are better at read the signals regarding female employees' productivity and can promote them to the positions where females can realize their potential better.

However, it is possible, that female managers would have a negative effect on the wages in a firm. Once appointed, they might need to gain their authority and to increase the company's efficiency and productivity. It might lead to the decrease in wages as a part of the "tighten the belt" policies. Another explanation of a possible decrease in wages and increased wage gaps would be an increase in labor discrimination due to "Queen Bee Syndrome".

In developing economies, it is possible that female CEOs would not, in fact, have a real power over the firm. Due to nepotism and corruption problems, the presence of female CEOs

does not necessarily mean that she is the key decision-maker in the firm, which either can have no influence on the outcomes or affect the results negatively. The firm may have a female CEO "on paper", however, the decisions regarding company's strategy and wage policies are made by a different person (say, a husband or a relative). This scheme is often used to hide the conflict of interests of the politicians or government officials or one of options to execute diverse options of tax evasion. Therefore, any CEO, female or male, would have no say in the decision-making, so his or her effect would not be significant.

Methodology

Data and Descriptive Statistics

Information about firm's employees and their wages and personal characteristics is taken from a linked administrative dataset conducted by Hungarian Academy of Sciences. It consists of data collected by Pension Directorate, Tax Authorities, the Office of Education, Public Employment Service and the Health Insurance Fund. Overall, this dataset contains 50% random sample of the population aged 5 - 74 from January 2003 till December 2011. It contains data on the employees' position, period of work, gender, and firm level data – revenues, total employment etc. For my analysis, I first restrict the sample by age and consider only workers starting from 18 years old. Then I the leave out all the government officials and civil servants to employ only the population working in corporate sector so the employment relationship would be labor contract ("Munkaviszonnyal foglakoztatott" in Hungarian). However, due to missing information regarding educational and firm-level characteristics the final panel is unbalanced. With this dataset, it is possible to evaluate how CEOs affect employees' wages and female employment.

Table 1 shows the descriptive statistics for a typical firm used in the analysis. The age of the average employee is 39 years, practically the same as median – 38 years old. Share of female workers is merely the same as males, however the average wage for women is predictably lower – 132815 HUF compared to 166470 HUF for males. The median number of workers in the firm is 65 while the 95th percentile number is 7300 with the average of 1392. Most of the firms are private with slightly than five percent being public. However, there is a significant number of non-domestic companies – around 40%.

	Mean	Std Dev	5 th percentile	Median	95 th percentile
Age	39	10.95	23	38	57
Share of female employees	0.49	0.5	0	0.49	1
Wage - males	166470	405644	43769	110176	450284
Wage - females	132815	154472	32440	95185	347842
Wage – total	151692	321017	37899	102002	404917
Number of workers in a firm	1392	4470	2	65	7300
Private company dummy	0.94	0.23	0	1	1
Domestic company dummy	0.59	0.49	0	1	1
Female CEO share	0.05	0.22	0	0	1

Table 1. Descriptive statistics

Table 3 presents the seven statistical regions in Hungary. The most of the respondents lived in Central Hungary in 2003 – it accounts for 42% of all the sample with Budapest as a regional center. Northern and Southern Great Plain are the second populated regions with the 12% and 11.4% respectively. The least populated region is Southern Transdanubia with 7% of the respondents in the sample.

Table 2: Regional	characteristics
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	Observations	Percent	Cumulative
Central Hungary	161 508	42.31	42.31
Central Transdanubia	38 985	10.21	52.52
Western	34 456	9.03	61.54
Transdanubia			
Southern	26 568	6.96	68.50
Transdanubia			
Northern Hungary	31 422	8.23	76.73
Northern Great Plain	45 347	11.88	88.61
Southern Great Plain	43 481	11.39	100.00
Total	381 767	100.00	

Empirical Strategy

To evaluate the effect of female top-managers I use the following baseline model:

$Y = \beta_0 + \beta_1 * Female_CEO + \beta_2 * Female + \beta_3 * Female_CEO * Female + \beta_4 * Controls + \varepsilon,$

where Y is the dependent variable, represented by the natural logarithm of employee's monthly wage, *Female_CEO*, variable of interest, is a dummy which equals to 1 if the company's CEO is female and 0 otherwise. For the companies with multiple CEOs I assign the value to 1 in case at least one of them is female and 0 otherwise. To construct this variable, I use the professional code 1210 from Hungarian Occupational Standard Classifications (FEOR – 08)² which identifies the position of CEO of the firm ("Gazdasági, költségvetési szervezet vezetője (igazgató, elnök, ügyvezető igazgató)" in Hungarian).

To evaluate the effect of female CEOs on wage gap I will compute the cross effect for females, working in a company with female top-manager, which is represented by the β_3 coefficient. We need to use the interaction effects to measure the difference between wage gaps and female / overall employment for male- and female-lead companies.

For baseline controls I will use the following variables: age and age^2 which would define the age of the individual, Profession code – set of dummies capturing different professions across the industries with approximately 30 different occupations. Region is a set of dummies representing place of residence in 2003 and featuring seven major regions in Hungary. Education is also a set of dummies, which represent the information about respondent's level of education. There are 13 different values describing education levels starting from primary school to Ph.D. and higher. The full list of possible values and their frequencies for these variables are available in the appendix. I use year dummies as controls in order to account for external shocks (like financial crises). In the further specifications in order to check for

² Full list of the standard occupational codes is available at:

https://www.ksh.hu/docs/szolgaltatasok/hun/feor08/feorlista.html [In Hungarian]

robustness, I add firm-level controls – industry dummies, dummy for private ownership, which is equal to 1 if the share of private holders exceeds 50% and 0 otherwise, dummy for domestic companies, which is also equals to 1 in case of share is more than 50%. I also test if the baseline results are robust for the sample which consists only of the large firms: this specification will feature the companies with the number of employees exceeding 100. As an extension, I analyze how the female CEOs can influence the overall number of female employees in the company.

I first use OLS as a baseline specification which then will be compared to FE model with the set of firm- and year fixed effects and the individual- and year fixed effects. If there would be no heterogeneity between firms, then ordinary least squares would provide consistent and efficient estimates. However, for the real-life data this assumption does not hold. Thus, it is important to use fixed effects to control for the firm effects and individual effects of each worker. Robust standard errors clustered at the worker level will be employed to account for heteroskedasticity in the regression analysis.

I also estimate the dynamics specifications to analyze the selection bias and to understand more clearly the dynamics of the process. I design the set of dummy variables which account for years before and after the firm switched from male to female CEO. Thus, the new variable T is constructed the following way: T < 0 in the pre-treatment years, T > 0 for the years after the firm switched from male to female CEO, and T = 0 for the year in which the event has occurred. Then T = -3, -2, -1, 0, 1, 2, 3+ where 3+ is the indicator for three and more years after the event. I use OLS, FE with firm and worker level effects to analyze how these models describe the degree of selection bias. In the second set of models I analyze the wage gap before and after the company switched to female CEO. I additionally interact the generated variable T with the dummy for females to check if the companies where the switch has occurred already had a different treatment of female employees. For this set of models, I also use OLS and FE with firm and worker level effects.

Regression Results

Baseline results: effect of female CEO on employees' wages and wage gaps

Table 3 shows the results of the regression analysis. For the visibility purposes, I present only the output for the variable of interest with the indicators for the specification used. The results suggest the expected wage gap between male and female workers: women on average receive a 10% lower wage compared to men. We can see that the presence of a female CEO has a significant positive effect on wages, although quite predictably its size diminishes once we add worker-level fixed effects.

The model with firm-level fixed effects produces not significant results, possibly due to low variation of female CEOs from firm to firm. Therefore, for the rest of specifications I employ only worker-level fixed effects. Individuals who work in the firms with a female CEO are expected to have 3.7% higher salary. This can be explained by the slightly different HR practices employed by females in the workplace in favor of the employees in terms of salaries and overall employment. Another explanation might be the selection bias as the CEOs are chosen non-randomly. It is possible that firms that already have higher salaries may tend to choose female CEOs.

However, companies with the female CEO still demonstrate gender gap– females would earn around 6% less in the fixed effects specification. What is the intuition behind these outcomes? The results suggest that companies with the female CEOs may discriminate other females stronger compared to the male-led firms. It is also possible that female CEOs may be appointed in the companies as an attempt to decrease wage gap, so the problem of selection still remains. The results suggest that although the wages tend to be higher on average, this effect applies mostly to males. Such outcomes may support the "Queen Bee" theory, when successful females would treat other women more "harshly", considering them as primary competitors or expecting more hardworking habits to become successful compared to males.

This effect stays in place for the extended specifications when firm-level characteristics are added or when the sample is restricted to the big firms. I test if the results are different for the firms with the average number of employees exceeding 100 – the wages in the firms with the female CEOs continue staying slightly higher while the wage gap for female workers is getting slightly lower but still stays significant.

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Ln(Wage)	Ln(Wage)	Ln(Wage)	Ln(Wage)	Ln(Wage)
Female_CEO	0.231***	-0.029	0.037**	0.042*	0.047**
	(0.007)	(0.038)	(0.019)	(0.024)	(0.024)
Female_CEO * Female	-0.071***	-0.025	-0.057**	-0.059*	-0.063**
	(0.009)	(0.021)	(0.024)	(0.032)	(0.031)
Female	-0.097***	-0.087***			
	(0.002)	(0.010)			
Baseline Controls	YES	YES	YES	YES	YES
Firm-specific controls	NO	NO	NO	NO	YES
Big firms sample	NO	NO	NO	YES	NO
Fixed Effects	NO	YES	YES	YES	YES
Fixed Effects Type	-	firm	individual	individual	individual
Observations	381 767	381 767	381 767	295 205	311 769
R-squared	0.26	0.21	0.21	0.28	0.30

Table 3. Baseline results: effect of female CEO on employees' wages and wage gaps

Notes: This table describes the impact of having a female CEO on the wages of all the employees and on the gender gap in earnings for female employees. All regressions control for year effects and worker specific characteristics: age, age squared, highest level of education and occupation. In the later specifications, I also control for the firm-level characteristics: dummies for domestic and private owned firms and industry level dummies. Big firms sample represent the companies with 100 or more employees. Regressions labeled "FE" also account for firm and worker level fixed effects (labeled as "firm" and "individual" respectively). Regressand: ln(Wage). Clustered standard errors are in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Finally, once the firm-specific controls are in place, the effect of female CEOs still remains: employees would get approximately 5% higher wages while females would still get lower wages. Firm-level controls are represented by the industry dummies, dummy for domestic firm and the dummy for the private companies. As expected, domestic firms tend to pay lower wages to the employees while the salaries in the private sector are higher compared to the public firms.

It is important to note that firm-specific characteristics, namely its size, status, internal policies and values may influence both the decision to hire female CEO and to tend to equalize the wages for males and females. A possible solution to battle this endogeneity would be adding firm-specific controls or finding an instrument, for example, the official (or not official) stance of the firm and its top-managers on equality. Regrettably, these solutions have the data-related limitations.

Baseline results: effect of female CEOs on the number of female workers

Another direction of interest is how female CEO influence the overall number of females in the company. Table 4 describes the results of the regression analysis where the female dummy instead of wage. I start with the OLS as a baseline and then use firm-level Fixed Effects model. Then I do the robustness check with the firm-level controls and sample where only large firms are included. The produced outcomes suggest that the probability of female worker to be employed in the company with the female CEO is significantly larger compared to the companies where the CEO is male. This outcome is robust to both specifications with the firm-level controls and sample where only large firms are present. Therefore, the probability of female worker to be employed by the firms with female CEO is 5% higher compared to the company where the CEO is male. The intuition behind these findings can be the following: female CEOs may encourage women to apply for the job in these companies or to create more female-friendly environment. However, reverse relationship is possible: in the companies with a lot of females the probability of one of them to become a top-manager is higher. But it is important to note that such situation is possible if the structure of employment for males and females is similar. How these results coincide with the previous findings regarding wage effect? Companies with female CEOs tend to have both higher salaries and more females in the workplace which support the previous findings in the existing literature regarding changes in HR practices. Higher number of females in the firms with female CEOs would also indicate "women helping women" pattern, however, the results also indicate that the wage gap still remains.

	(1)	(2)	(3)	(4)
VARIABLES	Female	Female	Female	Female
Female CEO	0.060***	0.039**	0.050**	0.049**
	(0.004)	(0.019)	(0.010)	(0.025)
Baseline Controls	YES	YES	YES	YES
Firm-Specific Controls	NO	YES	NO	YES
Big Firms Sample	NO	NO	YES	NO
Fixed Effects	NO	YES	YES	YES
Fixed Effects Type	-	firm	firm	firm
Observations	381 767	381 767	222 384	304 464
R-squared	0.16	0.11	0.10	0.11

Table 4: Baseline Re	esults: the effect	of female CEC)s on the number	of female worker
Lable 4. Dasellie Ko	esuits. the effect	of lemale CEC	s on the number	of female workers

Notes: This table describes the impact of having a female CEO on the number of female employees working in a company. All regressions control for year effects and worker specific characteristics: age, age squared, highest level of education and occupation. In the later specifications, I also control for the firm-level characteristics: dummies for domestic and private owned firms and industry level dummies. Regressions labeled "FE" also account for firm level fixed effects (labeled as "firm"). Big firms sample represent the companies with 100 or more employees. Regressand: ln(Wage). Clustered standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

The effect of female CEOs is not substantially different for female CEOs - it seems that how

"far away" the director is from the ordinary employees is irrelevant and the policies in big and

small firms do not differ in this respect. Alternatively, the selection process might be different

for the firms with the female CEOs – companies who assign higher wages or have more

females in staff would be more likely to choose a female CEO.

Dynamics Specification: the effect of switching from male to female CEO on wages and

wage discrimination

Table 5 demonstrates the results of the dynamics specification for the firms which switched from male to female CEO. Regression estimates (1) - (3) show the effect of female leadership on wages of all the employees: pre-treatment years indicate that there is a significant decrease in wages for the firms that will switch from male to female CEO which stays significant in all the specifications. Thus, two years before the change of the CEO employees would earn approximately 8.5% less compared with the employees in the firms which have not changed the leadership. The positive effect of female CEO on wages starts in the treatment year when the change occurs and continues for all the years after the third. However, these results are not entirely robust to the inclusion of the worker-level and firm-level fixed effects. Introduction of the fixed effects reduces the coefficients for pre-treatment years decreasing the wage effect from almost 20% to 8.5%.

However, we still see that there is a gap in wages between the employees of the firms which did not change the CEO and those who did. It might be explained by the bad performance of the previous CEO leading to the bad financial results and ultimately to wage decrease which would motivated the firm to change the leadership. The positive effect of the female CEO in the after-treatment years becomes not significant in the FE specifications while the negative effect on wages can be seem in the year two. The explanation can be the following: this decrease might be explained by the new restructuring policies enacted by the new CEO in order to enhance the efficiency of the company. Another possible explanation could be that most of this negative effect is related to the female wage gap due to possible increase in the discrimination. To separate these effect, I also account for the cross effect of female CEO on wage gap between males and females.

Regression results (4) - (6) show the effect of female CEO on both overall employees' wages and wage gap between males and females. The OLS estimates show the similar picture as before: there is a negative effect on wages in one and two years before the switch occurs which is getting even stronger compared to the previous specification. Female CEOs have positive effect on wages starting from the third year after the event took place. However, there

	(1)	(2)	(2)	(4)	(5)	(ϵ)
	(1)	(2)	(5)	(4)	(3)	$\frac{(0)}{1 - (W_{2,2,2})}$
VARIABLES	Ln(wage)	Ln(wage)	Ln(wage)	Ln(wage)	Ln(wage)	Ln(wage)
T3	-0.072	-0.010	-0.059	-0.254	-0.007	-0.103
1 = -5	(0.109)	(0.478)	(0.03)	(0.170)	(0.001)	(0.083)
T2	(0.10)	-0.087**	-0.080*	(0.170)	(0.071)	(0.003)
12	(0.111)	(0.039)	(0.03)	(0.144)	(0.055)	(0.073)
T - 1	_0 331***	(0.037)	(0.0+7)	-0 579***	(0.055)	(0.073)
1 – -1	(0.121)	(0.033)	(0.041)	(0.145)	(0.054)	(0.076)
T = 0	0 354***	0.031	(0.041) 0.032	-0 372***	0.007	-0 141
1 = 0	(0.034)	(0.031)	(0.032)	(0.107)	(0.067)	(0.111)
T - 1	(0.005)	-0.070	-0.067	-0.146	-0.061	0.143
1 – 1	(0.146)	(0.049)	(0.007)	(0.142)	(0.001)	(0.145)
T = 2	-0.061	-0.087**	-0.086**	0.096	-0.026	0 164
1 – 2	(0.152)	(0.037)	(0.036)	(0.112)	(0.020)	(0.169)
T = 3 + vears	0 187***	-0.044	-0.043	0.230***	-0.027	0.036*
I = 5 + yours	(0.013)	(0.034)	(0.034)	(0.007)	(0.038)	(0.019)
T = -3 * Wage gap	(0.015)	(0.051)	(0.051)	0 339	-0.004	-0.103
I = 3 Wuge Sup				(0.212)	(0.099)	(0.083)
T = -2 * Wage gap				0.306	0.084	-0.148
				(0.213)	(0.071)	(0.122)
T = - 1 * Wage gap				0.129	0.009	0.045
I I Wuge gup				(0.227)	(0.071)	(0.090)
T = 0 * Wage gap				0.040	0.037	0.127
- 0				(0.198)	(0.085)	(0.125)
T = 1 * Wage gap				-0.127	-0.009	0.054
6 6 1				(0.261)	(0.096)	(0.122)
T = 2 * Wage gap				-0.219	-0.086	-0.336*
				(0.235)	(0.060)	(0.203)
T = 3 * Wage gap				-0.076***	-0.030	-0.056**
				(0.022)	(0.021)	(0.024)
Baseline Controls	YES	YES	YES	YES	YES	YES
Firm-specific controls	NO	NO	NO	NO	NO	NO
Big firms sample	NO	NO	NO	NO	NO	NO
Fixed Effects	NO	YES	YES	NO	YES	YES
Fixed Effects Type	-	firm	individual	-	firm	individual
Observations	379 362	379 362	379 362	379 362	379 362	379 362
R-squared	0.26	0.20	0.20	0.26	0.20	0.21

Table 5: Dynamics for the effect of female CEO on employees' wages and gender gaps

Notes: The table describes the result of the regression analysis for the dynamics specification. The event year is represented by "T = 0" while the year "3+" equals to 3 or more years after the company switched from male to female CEO. All regressions control for year effects and worker specific characteristics: age, age squared, highest level of education and occupation. Regression labeled "FE" also account for firm level fixed effects (labeled as "firm"). Regressand: ln(Wage). Clustered standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

is a significant negative effect on wages of all the employees in the year where the company switched from male to female CEO. It can be possibly explained by the bad performance of the company in the years just before the change of the CEO occurred which would enact the "belt-tightening" policies. On the other hand, change of CEO itself may be a factor contributing to lower wages, regardless of gender his gender.

The results demonstrate no significant gender gap in wages until the year three after the company changed its CEO while the overall wages would go up: the coefficient demonstrates that females would earn at least 8% less while the overall wages would be around 20% higher compared to the firms which have not switched the CEO.

Once the fixed effects specification is enabled, the effect is again getting smaller, just like in the regressions without the interaction effects. The pre-treatment effect for year two decreases to 15% where the employees of the firms where the switch has occurred would again earn less. However, the negative impact on wages becomes not significant for the year of the event and for the previous year. Positive effect of the female CEO on the employees' salaries starts only from the third year after the change happened. Thus, workers in companies which changed the CEO three and more years ago would earn 3.6% more. Wage gap remains in place in the FE specification starting even earlier, from year two after the treatment - however, there is a decrease in its scale: the coefficient for the interaction variable decreases from -0.336 to 0.056.

Overall, the obtained results are consistent with previous baseline outcomes for the effect of female CEO dummy. There is a pronounced effect of female leadership on the HR policies, namely, policies regarding wages. I find that the employees of female-led firms would earn around 4% more after the firm switches from male to female CEO. However, this effect does not start immediately, since the firm need to adjust to the new policies. In fact, there is a

significant decrease in wages two years before the new CEO was appointed which stays robust to all the specifications. This can be explained by the inefficiency of a previous CEO who could motivate the firm to switch to the new one. Another side is the bankruptcy of the company which results in the forced change or CEO and ownership in general. This factor also may contribute to the decrease in wages.

Although the wages are higher for the female-led firms, the wage gap for female employees becomes pronounced from the year two after the female CEO is appointed. However, its effect is getting smaller yet staying significant, so the women would earn around 6% less. Companies who experience change of CEO may be different from those who did not have new appointments. Their performance may be less productive or the overall industry may experience the downturn. Often, a new CEO is appointed when the owners are not satisfied with the results or the current CEO is offered a better position or contract in another firm which may ultimately affect the wages of the personnel. Another limitation is related to the overall small number of female CEOs and the companies which switch from male to female leader. This may partly explain the not significant firm-level fixed effects output.

Dynamics Specification: the effect of switching from male to female CEO on the number of female employees

Finally, I repeat the dynamics estimation for the interaction effects between the female dummy and the dummy variables for years before and after company switches to female CEO. Table 6 describes the results of the regression analysis. The results show that Pre-treatment coefficients appear to be not significant for the OLS specification, however, two years after female CEO is appointed there is a positive effect on the number of females working in the company. After three years and more this impact diminishes but still stays positive and significant. Fixed effects model produces similar results; however, the effect starts only from the third year and is less pronounced compared to the OLS outcomes.

	(1)	(2)
VARIABLES	Female	Female
T = -3	0.072	0.041
	(0.083)	(0.033)
T = -2	0.062	-0.007
	(0.092)	(0.030)
T = -1	0.111	0.011
	(0.089)	(0.014)
$\mathbf{T} = 0$	0.092	-0.027
	(0.086)	(0.035)
T = 1	0.125	0.038
	(0.090)	(0.041)
T = 2	0.179**	0.036
	(0.089)	(0.031)
T = 3 + years	0.059***	0.038**
	(0.010)	(0.018)
Baseline Controls	YES	YES
Firm-specific controls (domestic,	NO	NO
private)		
Big firms sample, $empl > 100$	NO	NO
Fixed Effects	NO	YES
Fixed Effects Type	-	firm
Observations	379 362	379 362
R-squared	0.16	0.13

Table 6: Dynamics for the effect of female CEO on the number of female employees

Notes: The table describes the result of the regression analysis for the dynamics specification. The event year is represented by "T = 0" while the year "3+" equals to 3 or more years after the company switched from male to female CEO. All regressions control for year effects and worker specific characteristics: age, age squared, highest level of education and occupation. Regression labeled "FE" also account for firm level fixed effects (labeled as "firm"). Regressand: ln(Wage). Clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Thus, the number of female employees in a firm is 3,8% higher compared to the male-led

companies if the female CEO was appointed three and more years ago. It is possible that

female CEO motivates females to apply to this firm once they observe her results during the

previous years. On the other hand, the initiative to hire more females may come from CEO

itself. This is consistent with the "women-helping-women" pattern where female managers

tend to support and promote more female colleagues.

To sum up, the results show the pronounced effect of the female leadership in the company.

The appointment of the female CEO seems to increase the wages of all the employees,

however the wage gap for female employees still remains. On the other hand, there is a positive relationship between female leadership and the number of female employees in the company which starts after few years female CEO is appointed.

Conclusion

Gender diversity topics have become a matter of concern and discussion in the developed countries. However, developing and post-transition countries may be different in that respect – and the results they produce may differ. In my research, I analyze the effect of female leadership on workplace discrimination in Hungary. I find that female CEOs positively affects overall wages while the wage gaps between males and females remains for female-managed firms. At the same time, there is a positive effect of female leadership on the number of female employees, which accounts for approximately 4% difference.

All the results are robust to the expended specifications with the fixed effects and firm-level controls. Dynamics analysis also supports the obtained results. In addition, I find no difference in the effect of female leadership for the sample which consists of the larger firms only.

The results carry on and partly support the outcomes of the previous studies and contributes to the literature on workplace organization and female leadership. Most of the previous research is dedicated to the western countries while I focus on developed³ yet post-transition country. I do not find the positive effect of the female CEOs on wage gap however, I find a positive impact on the overall wages and on the number of female employees. Therefore, it is possible that there is a "women-helping-women" pattern regarding hiring practices.

Suggestions for the future research can be the following: it is important to analyze how female CEOs influence the overall employment in the company. Existing research on developed countries shows that female managers tend to have fewer lay-offs, however, the results may differ for the developing countries. Another possible direction is to separate the between and within firm effects for the employees and to analyze which part of the impact is

³ According to World Economic Situation and Prospects (WESP) country classifications report prepared by the Department of Economic and Social Affairs of the United Nations Secretariat (UN/DESA). Available at: http://www.un.org/en/development/desa/policy/wesp/wesp_current/2014wesp_country_classification.pdf

related to the employees changing firms with male CEO for the firms with female one and which part is related to the changes within firm. Another possible direction is to examine how the results for the effect of the female CEOs are different on the different ends of wage distribution.

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Appendix

Table	1A:	Highest	Level	of	Education
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	Frequency	Percent	Cumulative
Primary school	17 698	4.64	4.64
(általános iskola)			
Middle school	102 983	26.98	31.61
(középfok)			
Gymnasium, primary	468	0.12	31.73
(kisgimnázium)			
Gymnasium, primary or	1 754	0.46	32.19
middle			
(közép vagy kisgimnázium;			
Primary school or	30	0.01	32.20
gymnasium			
(általános iskola vagy			
kisgimnázium)			
Primary or middle school	474	0.12	32.33
(általános iskola vagy			
közép)			
Primary, middle and high	93	0.02	32.35
school			
(mindhárom típus			
lehetséges)			
Art or technical college	3508	0.92	33.27
(csak művészeti vagy			
kollégium)			
College	83 810	21.95	55.22
(főiskola)			
University	134 072	35.12	90.34
(egyetem)			
Ph.D.	19 319	5.06	95.40
(phd)			
Higher than Ph.D.	16 345	4.28	99.68

(felsőfok)			
Public School and Higher	1219	0.32	100
Education			
(közoktatás és felsőoktatás			
is)			
Total	381 767	100.00	

Table 2A: Professional codes as per Hungarian Standard Occupational Classification:

(Foglalkozások Egységes Osztályozási Rendszere (FEOR-08))

	Frequency	Percent	Cumulative
Top managers, professional leaders	11 758	2.99	3.09
(Igazgatási, érdek-képviseleti vezetők)			
Professionals in sphere of IT, technical and natural	23 166	6.07	9.15
sciences			
(Műszaki, informatikai és természettudományi			
foglalkozások)			
Professions in sphere of healthcare (with required	1 022	0.27	9.42
highest qualification)			
(Egészségügyi foglalkozások (felsőfokú			
képzettséghez kapcsolódó))			
Social services professions (with required highest	695	0.18	9.60
qualification)			
(Szociális szolgáltatási foglalkozások (felsőfokú			
képzettséghez kapcsolódó))			
Teachers	11 245	2.95	12.54
(Oktatók, pedagógusok)			
Economists and lawyers	13 859	3.63	16.17
(Gazdalkodasi, jogi es tarsadalomtudomanyi)			
Culture, art and sport- related occupations with the	5 027	1.32	17.49
highest qualification			
(Művészeti, kulturális, sport- és vallási			

foglalkozások)			
Other qualified administrators	5 307	1.32	17.49
(Egyéb magasan képzett ügyintézők)			
Technicians and related professions	24 560	6.43	25.31
(Technikusok és hasonló műszaki foglalkozások)			
Helthcare profesionals with second qualification	5 619	1.47	26.76
(Egészségügyi foglalkozások)			
Educational assistants	1 276	0.33	27.12
(Oktatási asszisztensek)			
Social services and services for the labor market	3 696	0.97	28.09
professions			
(Szociális gondozási és munkaerő-piaci			
szolgáltatási foglalkozások)			
Business related administrators	37 331	9.78	37.87
(Üzleti jellegű szolgáltatások ügyintézői, hatósági			
ügyintézők, ügynökök)			
Culture, art and sport- related occupations with the	6 127	1.60	39.47
second qualification			
(Művészeti, kulturális, sport- és vallási			
foglalkozások)			
Other administrators	16 181	4.24	43.71
(Egyéb ügyintézők)			
Office, administrative workers	29 479	7.72	51.43
(Irodai, ügyviteli foglalkozások)			
Client-oriented professions	18 593	4.87	56.30

(Ügyfélkapcsolati foglalkozások)			
Commerce and catering	69 774	18.28	74.58
(Kereskedelmi és vendéglátó-ipari foglalkozások)			
Services area professions	14 623	3.83	78.95
(Szolgáltatási foglalkozások)			
Agriculture professions	2 068	0.54	78.95
(Mezőgazdasági foglalkozások)			
Workers employed in forest and fish industry	390	0.10	79.0
(Erdőgazdálkodási, vadgazdálkodási és halászati			
foglalkozások)			
Workers employed in food industry	2749	0.72	79.77
(Élelmiszer-ipari foglalkozások)			
Workers employed in light industry	3 370	0.88	80.66
(Könnyűipari foglalkozások)			
Workers employed in metal and electrical industry	10 011	2.62	83.28
(Fém- és villamosipari foglalkozások)			
Workers employed in craft professions	482	0.13	83.40
(Kézműipari foglalkozások)			
Workers employed in construction industry	4 418	1.16	84.56
(Építőipari foglalkozások)			
Workers in other construction and industrial areas	622	0.16	86.91
(Egyéb ipari és építőipari foglalkozások)			
Machinery operators	8 359	12.19	88.53
(Feldolgozóipari gépek kezelői)			
Machinery assemblers	6 179	1.62	88.90

(Összeszerelők)			
Stationary machinery workers	1 411	0.37	88.90
(Helyhez kötött gépek kezelő)			
Operators of mobile machinery, drivers	4 423	1.16	90.06
(Járművezetők és mobil gépek kezelői)			
Non-qualified workers	37 947	9.94	100.00
(Szakképzettséget nem igénylő (egyszerű)			
foglalkozások)			
Total	381 767	100.00	