

# Gender wage gap in the workplace: Does the age of the firm matter?

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## Extended Abstract

### Introduction

Despite substantial changes in OECD labor markets and an improvement in female employment and participation rates, gender differences in pay remain high. This gap is explained primarily by personal characteristics, such as education and age (Christofides, Polycarpou, & Vrachimis 2013), differences in women's and men's career decisions and related labor market experience and working hours (Blau & Kahn 1999; OECD 2012), as well as the time spend with family and household related activities (Manning & Swaffield 2008; Hundley 2001, Cukrowska-Torzewska & Lovasz, 2016). Nevertheless, a large part of the gap is still not fully explained by the above factors, and thus it is attributable to unobserved differences or discriminatory practices (OECD, 2012, Triventi, 2013). The issue of the gender wage gap therefore continues to attract attention, both by researchers trying to fully understand its roots and development, and by policymakers. In this context, policymakers enforce regulations and equal treatment laws that demand firms to pay equal wages to men and women. Yet there is a mounting evidence of pay gaps between men and women that are existing also at the firm level.

In this paper we analyze firm level gender pay gaps, with the aim of answering the question whether there is a link between firm-level gender wage inequality and firm's age. We examine four post-transition European countries: Poland, Hungary, Czech Republic and Slovakia. The rationale standing behind this country selection is that all countries are characterized by a relatively low female participation rate, labor market inflexibility (low share of part-time workers) and relatively high share of public sector. The countries have also experienced a transition to a market oriented economy, meaning that many old companies that remain operating in the market, have been set up during the communism time and have been privatized. We show that the transition to a market economy provides us with a valuable context that allows us to distinguish between competing theoretical explanations standing behind the link between firms' age the gender wage gap we uncover.

### Related literature

Most studies of gender pay gaps focus on economy-wide gender wage differentials. However, wage policies at firm level may shape gender wage differentials. Firstly, better (lower) paying firms may be more likely to hire men (women), (Blau 1977). Several studies suggested that the

differential sorting of men and women may explain a part of the gender wage gap (Bayard et al 2003, Hospido 2009, del Bono and Vuri 2011). Women may be also less likely than men to move to higher paid jobs in firms (Hospido, 2009; Del Bono and Vuri, 2011) and women benefit less from firm-to-firm mobility than men (Card, Cardoso & Kline). Female lower bargaining power, and lower ability to start and to be successful in wage negotiations (Bowles, Babcock and Lai 2007) are also used as an explanation of their lower wages.

The importance of the ‘age’ of the company and the timing in which it has been set up is also stressed by the number of studies. However, existing evidence does not provide a clear picture of the link between firms’ age the gender wage inequality. On one hand, new businesses exhibit greater heterogeneity in earnings and productivity than do mature businesses. As firms age, businesses that have made errors with their worker mix (and on other dimensions) either exit or adjust their worker skill mix in the direction of the profiles of mature businesses (Haltiwange et al 2007). Start-ups tend also to pay lower wages, *ceteris paribus*, as on average, wages in newly founded establishments are 8% lower than in similar incumbent firms (Brixy, Kohaut, Schnabel 2007). In contrast, firms that have been operating for longer time tend to pay higher wages (Haltiwange et al. 1999). This makes us hypothesize that among new companies, due to a greater heterogeneity in earnings and productivity than among mature businesses, the gender pay gaps might be lower. On the other hand, however, in line with Becker’s theory of discrimination (1957) the importance of firm specific gender pay gaps may be related to firms’ competition pressure (Li and Dong 2011). Heinze and Wolf (2010) find that firms operating under strong product market competition behave in a more egalitarian way. Black and Brainerd (2004) show that increased competition (from globalization) may force employers to discriminate less. This evidence thus rather suggests that new businesses might be displaying lower wage gaps, as they cannot afford discrimination in order to stay on the market.

The fact that we focus on transition economics provides some useful insights to our analysis. In particular, in transition countries, old firms started operating before the market changes, and therefore are likely to carry the legacy of the past, including lower overall wage dispersion. These firms are also likely to represent former state-owned companies that have been privatized. We can thus expect that in these firms pay policies are likely to be more equal, and consequently wage inequality between men and women is likely to be smaller. On the other hand, however, the fact that these companies have survived the transition and market change, could suggest that they are likely to exploit their established position and enforce more of discriminatory wage practices.

### **Data and research method**

For the analysis we use the data coming from 2010 Structure of Earnings Survey, which is a large matched employer-employee database distributed by Eurostat. We define the hourly wage as the average gross hourly earnings in a given month. The primary variable of our interest, mainly the age of the firm, is not given in the dataset. We thus derive this measure indirectly using a proxy of the maximum tenure of employees in a given firm (Magda et al. 2012). We categorize firms’ age into four groups: aged 0-3, aged 3-10, aged 10-20 and older than 20 years. Importantly, the last category is likely to represent firms that have existed before the transition (as public firms) and that have been privatized.

The sample sizes, in terms of all employees and firms, along the distribution of firms' age are shown in Table 1. The data reveal that countries selected for the analysis differ in terms of the sample size, with the greatest number of observation reported for Hungary and the smallest number for Slovakia. While in Slovakia and Czech Republic firms employ on average more than 100 workers, in Poland and Hungary the average firm size is much smaller (around 30-40 workers). The distribution of firms' age is comparable for Poland and Czech Republic, in which we observe small fraction of new (young) firms (around 7-8%), and significant fraction of firms older than 20 years (around 44-52%). While in Slovakia, we do not observe as high fraction of old firms, in Hungary there is slightly greater fraction of new business (16%).

**Table 1. Descriptive statistics**

	<b>Czech Republic</b>	<b>Hungary</b>	<b>Poland</b>	<b>Slovakia</b>
<b>No of firms</b>	18 046	26 529	17 041	5 799
<b>No of individuals</b>	1 993 625	835 207	681 702	773 860
<b>Average size</b>	110	31	40	133
<b>Distribution of workers across firm cohorts</b>				
<b>Age: 0-3</b>	8%	16%	7%	7%
<b>Age: 3-10</b>	15%	23%	19%	27%
<b>Age: 10-20</b>	25%	24%	30%	37%
<b>Age:&gt;20</b>	52%	37%	44%	28%
<b>% private sector workers</b>	75%	65%	63%	70%

Our empirical analysis of the link between the age of the firm and firm level gender pay gap is based on OLS regressions, in which the dependent variable is the logarithm of an hourly wage rate and the key independent variable is female dummy that captures the gender wage gap. In the regressions we control for individual level characteristics that include individuals' age, education, tenure, part-time status job, occupation as well as co-workers characteristics. At the firm level we control for the firm size, firm age, NACE and region. To examine how firm characteristics, and especially firms' age, contribute to the gender wage gap, we interact firm level controls with female dummy variable. The interaction terms thus reveal how much of the gender wage gap is explained by a given firms' characteristic.

## **Early results**

Table 2 summarizes results obtained from regressing female dummy interacted with variables reflecting firms' age on the log of hourly wage rate. In specification [1] we run the OLS on log wages controlling for a set of individual, job and firm level characteristic, which yields an adjusted gender wage gap of 14% (in Hungary) to 21% in Slovakia. Once we add controls for firm's cohort (specification [2]), the results vaguely change. In specification [3] we add interactions between gender and firm's age, which leads to interesting results. The interaction effects between gender and firm's age shows that there appears to be a clear positive association between firm's age and gender pay gaps among workers. Women are less disadvantaged in terms of pay in the youngest firms- the gender pay gap virtually disappears in Czech Republic and Hungary, and is significantly lowered in Poland and Slovakia in the firms operating in the market for less than three years. Workers in firms aged 3-10 years also display lower gender pay gaps compared to those employed in firms operating for 10 -20 years. Workers from the

oldest firms, which existed before the launch of the economic transition in 1990 display even higher gender pay gaps compared to workers in firms aged 10-20 years in Hungary and Slovakia. This finding is, however, not observed in Poland and the Czech Republic.

**Table 2. OLS results: firms' age and gender wage gap in Czech Republic, Hungary, Poland and Slovakia**

	Czech Republic			Hungary			Poland			Slovakia		
<i>Specification</i>	[1]	[2]	[3]	[1]	[2]	[3]	[1]	[2]	[3]	[1]	[2]	[3]
Female	-0.152***	-0.154***	-0.186***	-0.131***	-0.132***	-0.142***	-0.158***	-0.159***	-0.180***	-0.198***	-0.198***	-0.213***
	(0.003)	(0.003)	(0.005)	(0.002)	(0.002)	(0.005)	(0.001)	(0.001)	(0.002)	(0.003)	(0.003)	(0.005)
Female * age0-3			0.168***			0.116***			0.027***			0.087***
			(0.019)			(0.010)			(0.007)			(0.024)
Female * age 3-10			0.077***			0.054***			0.042***			0.054***
			(0.009)			(0.007)			(0.004)			(0.008)
Female * age >20			0.009*			-0.041***			0.029***			-0.017***
			(0.005)			(0.005)			(0.003)			(0.005)
<i>Controls:</i>												
Personal	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Job characteristics	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Firm characteristics	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Firm's age	no	yes	yes	no	yes	yes	no	yes	yes	no	yes	yes
Interactions female*firm's age	no	no	yes	no	no	yes	no	no	yes	no	no	yes
Number of observations	1,981,785	1,981,785	1,981,785	835,207	835,207	835,207	681,702	681,702	681,702	773,860	773,860	773,860

Notes: Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; Personal characteristics include: age, education, tenure; job characteristics include: occupation, part-time status; firm characteristics include: size, NACE, region.

We next examine the link between the age of the firm and firm level gender wage gap by sector. The results are presented in Table 3. The results show that among private sector companies there is a clear link between the age of the firms and the size of the firms' gender pay gap that is consistent for all four countries. Young, newly establishes, private firms display the lowest wage inequality that gradually increase once the firms operate in the market for a longer time. The finding is therefore in line with the competition hypothesis, meaning that younger firms are not in the position to treat workers who share similar characteristics differently with respect to pay and cannot afford discrimination. Our findings also show that among private firms operating in the market for more than 20 years, that is firms that have existed before 1990s as public companies and that have been privatized following the transition, gender wage inequality is the greatest. This stands in contrast to our expectations that in privatized companies, due to the legacy of the former system, and particularly due to the relatively flat wage distribution and the existence of the wage grid, companies policies include more equal pay schemes. These results thus also support the competition hypothesis, according to which older firms that have a well-established position in the market, do not need to compete with other companies for employees and therefore may follow less equal pay policy schemes.

**Table 3. OLS results: firms' age and gender wage gap in Czech Republic, Hungary, Poland and Slovakia, by sector**

<i>Specification</i>	Private sector				Public sector			
	Czech Republic	Hungary	Poland	Slovakia	Czech Republic	Hungary	Poland	Slovakia
Female	-0.189*** (0.005)	-0.161*** (0.005)	-0.199*** (0.003)	-0.210*** (0.006)	-0.051*** (0.007)	-0.094*** (0.006)	-0.099*** (0.005)	-0.183*** (0.009)
Female * age0-3	0.180*** (0.019)	0.122*** (0.011)	0.041*** (0.008)	0.082*** (0.025)	0.010 (0.014)	0.061*** (0.017)	0.121*** (0.018)	0.172*** (0.037)
Female * age 3-10	0.083*** (0.009)	0.059*** (0.008)	0.060*** (0.004)	0.064*** (0.009)	-0.004 (0.037)	0.052*** (0.013)	0.022*** (0.007)	-0.047*** (0.012)
Female * age >20	-0.057*** (0.005)	-0.068*** (0.009)	-0.042*** (0.004)	-0.060*** (0.007)	-0.090*** (0.007)	-0.065*** (0.006)	0.023*** (0.005)	0.006 (0.009)
Number of observations	1,160,321	156,981	348,197	510,093	821,464	678,226	333,505	263,767
R2	0.432	0.422	0.440	0.393	0.560	0.619	0.512	0.477

Notes: Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; regressions control for personal characteristics (age, education, tenure), job characteristics (occupation, part-time status), firm characteristics (size, NACE, region).

## Conclusion

Economic theories offer different explanations for the link between the degree of gender wage inequality and companies' characteristics, especially with regards to firms' age. In this paper we examine the relation between firm level wage gaps and firms' characteristics for four post-transition economies, distinguishing between public and private companies. Post-communist countries offer a valuable context, as for these economies, companies that are operating in the market for long time, are likely to represent firms that have been privatized and that have moved from setting their wages under the communist wage grid system, to a market competitive

scheme. The findings reveal that in private companies, operating in competitive market, the gender wage gaps do vary substantially depending on firms' age. In particular, the lowest wage inequality is seen in newly established firms and the gender pay gap is likely to increase as the firm stays in the market. The fact that the highest gender wage gap is observed for old companies, that have been set up before the market changes, suggests that under competitive market structure, companies that have a well-established position in the market, are less likely to follow equal wage policies, and practice greater wage differentiation with respect to gender.

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