Overview of Firm-Size and Gender Pay Gaps in Turkey: The Role of Informal Employment

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Overview of Firm-Size and Gender Pay Gaps in Turkey: The Role of Informal Employment*

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Abstract

This paper documents two new facts linking firm-size and gender pay gaps to informal employment using micro-level data from Turkey. First, we show that the firm-size wage gap, defined as larger firms paying higher wages to observationally equivalent workers, is greater for informal employment than formal employment. And, second, we find that the gender pay gap is constant across different firm-size categories for formal employment, while it is a decreasing function of firm size for informal employment. These two facts jointly suggest that the informality status of a job is a valuable source of information in understanding the underlying forces determining firm-size and gender wage gaps. We propose and discuss the relevance of alternative mechanisms that might be generating these facts.

JEL codes: C21, E24, J31, J71.

Keywords: Informal employment; wage differentials; firm size; gender discrimination; THLFS.

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1 Introduction

Observationally equivalent workers are paid different wages in the labor market. These wage differentials are multi-dimensional. For example, it is well documented that men are paid better than women even after controlling for education, tenure, age, marital status, etc.[1] Similarly, white Americans are paid better than observationally equivalent black Americans.[2] The residual wage differentials across gender and race categories are often attributed to discrimination in the labor market.[3] Wage differences are also documented for margins other than gender and race. For example, larger firms pay higher wages to observationally equivalent workers than smaller firms. This fact is named in the literature as the "firm-size wage gap."[4] Exporters pay higher wages compared to non-exporters, which is named as the exporter wage premium [Bernard and Jensen (1995)]. Finally, formal (i.e., tax-registered) employment yields, on average, higher wages than informal employment, controlling for observed variation [see, e.g., Heckman and Hotz (1986)].

In this paper, we contribute to the existing literature by documenting two new facts on firm-size and gender pay gaps along the formal-informal divide using micro-level data from Turkey. First, we show that the firm-size wage gap is larger for informal jobs in comparison to formal ones, meaning that the relative premium of working in a large firm is more pronounced for informal workers than formal workers. Second, the gender pay gap for informal workers is quite large in small firms and it gets smaller as firm size goes up. In other words, the gender pay gap is a decreasing function of firm size for informal employment. For formal employment, on the other hand, the gender pay gap is notable, but it does not depend on firm size.

In our empirical analysis, we use the Turkish Household Labor Force Survey (THLFS) micro-level data in yearly frequency for the period 2006–2012. THLFS is a nationally-representative dataset and it surveys around 500,000 people each year. It aims to capture personal and work-related characteristics of the household members, which allows us to estimate wage gaps

[1] See Altonji and Blank (1999) and Bertrand (2011) for excellent literature reviews on various aspects of the gender pay gap.
[2] See Lang and Lehmann (2012) for a recent survey on racial wage gaps.
[3] Lang and Manove (2011) show that the racial wage differences persist even after controlling for proxies for unobserved ability.
[4] See Oi and Idson (1999) for a detailed review of the literature.

controlling for a rich set of observed covariates. Since approximately 25 percent of the workers are employed in informal jobs in Turkey, this dataset serves as a natural laboratory for studying labor market issues related to informal employment.

We start our analysis by documenting formal-informal differences in firm-size wage gaps. In the literature, the firm-size wage gap is estimated by incorporating the firm-size variable into the standard Mincerian wage regressions.[5] We also perform a similar exercise. The only difference is that we estimate these wage regressions for formal and informal workers, separately. These regressions include firm size as a key variable along with the usual variables such as gender, age, and education in addition to the dummy variables controlling for year, region, occupation, and industry effects. We describe firm size in 5 categories with size 1 being the smallest firm and 5 being the largest. We find that a formal worker employed in a size-5 firm earns 16.8 percent more relative to an observationally-equivalent formal worker employed in a size-1 firm. In other words, the "size premium" in formal employment is 16.8 percent. However, the size premium is significantly larger among informal workers. Specifically, an informal worker employed in a size-5 firm gets paid 26.7 percent more than an observationally-equivalent informal worker employed in a size-1 firm. This is a sizable difference and it deserves special attention.

We argue that four alternative mechanisms can potentially explain this fact. *First*, formal jobs are subject to taxes and informal jobs are not. Taxes impose a wedge between the size premium in informal jobs versus that in formal jobs. *Second*, larger firms, on average, may have greater skill requirements both for the formal and informal jobs they offer. However, informal jobs with higher skill requirements may fail to attract a large number of applicants, since skilled workers normally opt for formal jobs. This might lead to sharper wage increases in informal jobs as firm size goes up. *Third*, information on job opportunities in informal jobs are most likely exchanged within informal networks (such as relatives, friends, neighbors, and other acquaintances) rather than formal channels (such as public ads). This can potentially reduce the size of the applicant pool for informal jobs. *Finally*, applicants may be valuing other job-specific (pecuniary and/or non-pecuniary) amenities along with pay. This kind of

[5] See Mincer (1958), Mincer (1974), Heckman et al. (2006), and Lemieux (2006) for background information on Mincerian wage equations.

amenity packages are weak in informal jobs, by definition. This weakness may itself lead to a smaller applicant pool in informal jobs if the weight assigned to these side amenities are high enough. Given a certain number of vacant informal jobs, a smaller pool of applicants would push the wage offers up.

Next we document the formal-informal differences in the gender pay gap as a function of firm size. The coefficient of the gender dummy in the Mincerian wage regression is the key parameter in this exercise. Our regressions condition on 5 size categories along with the formality status of the worker, which means that 10 different regressions are performed. We find that, for formal workers, the coefficient of the gender dummy—which takes 1 for females and 0 otherwise—stays roughly constant (between -10 percent and -12 percent) across the size categories. This is equivalent to saying that the firm size does not significantly affect the gender pay gap for formal employment. For informal employment, however, the gender pay gap is around 24 percent for size-1 firms, while it monotonically declines with firm size and gets equalized to the gender pay gap for formal workers in size 5. Hence, unlike formal employment, the gender pay gap is a decreasing function of firm size for informal employment.

We then perform the same regressions conditioning separately on the pre- and post-crisis periods. We still observe the monotonically decreasing gender pay gap for informal employment in both periods. However, an interesting result emerges for the largest (i.e., size-5) firms. The gender pay gap for informal employment is no longer equal to the gender pay gap for formal employment in size-5 firms. For the 2006–2009 period, the gender pay gap in size-5 firms is much higher for informal jobs than formal jobs. For the 2010–2012 period, however, we see that the gender pay gap in size-5 firms is much lower for informal jobs than formal jobs. This means that, for the latter period, the widespread belief that informal jobs are more discriminatory against women than formal jobs holds only partially. To be specific, for the 2010–2012 period, we find that informal jobs discriminate against women in small firms; but, in large firms, they are less discriminatory against (or more liberal toward) women than formal jobs.[6] We argue later in the paper that the main reason for this pre- versus post-crisis difference

[6]In line with this observation, Tansel (1997) also shows that although there is a gender pay gap for formal workers, no such comment could be made for informal ones.

might be the widespread implementation of employment subsidy programs in Turkey in the post-crisis era.

Hence, our contribution to the literature is two fold. First, we show empirically that the firm-size wage gap is not homogeneous among formal and informal workers and is actually more pronounced for the latter. Then, we characterize the gender pay gap as a joint function of the formality status and firm size, and find the that gender pay gap is a decreasing function of the firm size for the informal workers, while it stays roughly constant for formal ones.

The plan of the paper is as follows. Section 2 provides a summary of the literatures on firm-size and gender wage gaps. Section 3 describes our dataset and presents detailed summary statistics. Section 4 explains our empirical methodology and discusses the estimation results. Section 5 concludes with brief remarks on future work.

2 Related Literature

There is a consensus in the labor economics literature that formal and informal labor markets are subject to segmentation, at least partially. In other words, the fundamentals determining wage and employment outcomes for informal jobs are structurally different from the fundamentals determining those for formal jobs. This is called the "dual labor markets" hypothesis and papers including Stiglitz (1976), Dickens and Lang (1985), and Heckman and Hotz (1986) argue in favor of the relevance of this hypothesis.[7] In this paper, we argue that duality leads to interesting patterns about firm-size and gender pay gaps along the formal-informal divide. Before we present our empirical findings on these patterns, we briefly review the literatures on firm-size and gender pay gaps below.

2.1 Firm-Size Wage Gap

It is a well-documented fact that larger firms pay higher wages to observationally equivalent workers than smaller firms.[8] The finding that a firm-size wage gap exists is robust and

[7] See Magnac (1991) for an opposing view.

[8] See Oi and Idson (1999) for a comprehensive review of the early literature. Breakthrough papers in the literature that deserve attention include Mellow (1982), Brown and Medoff (1989), and Groshen (1991).

invariably holds across studies for different countries, years, and job categories.[9] Several explanations are offered in the literature ranging from unobserved worker heterogeneity [Idson and Feaster (1990)] to unobserved firm productivity [Idson and Oi (1999)] and from the need for better data [Troske (1999)] to firm-level differences in labor turnover due to differences in hiring and human resource management practices [Idson (1996)]. However, none of these points fully explain the observed patterns and the firm-size wage gap still remains as an important empirical puzzle in labor economics.

Although the existence and magnitude of observed firm-size wage differentials are well-known in literature, there is no paper examining the firm-size wage differences along the formal-informal divide. We try to fill this gap in the literature by estimating firm-size wage gaps for formal and informal employment separately.

2.2 Gender Wage Gap

Early theoretical literature on labor market discrimination suggests that larger firms are more likely to discriminate against minorities or disadvantaged groups than smaller ones due to higher market power they have [see, e.g., Becker (1971)]. However, the empirical literature suggests the opposite: small firms are more likely to discriminate. For example, Heinze and Wolf (2006) find that within-firm gender pay differentials are smaller than the average gender pay gap for the economy and gender gap is a decreasing function of the firm size in Germany. Therefore, they implicitly show that large firms are more egalitarian in comparison to the small ones. This question is also studied in the racial discrimination literature. Sorensen (2004) shows that smaller firms are more racially segregated than the larger ones. This observation also supports the idea that larger firms are more egalitarian than smaller firms. Other papers along these lines include Smith and Welch (1984), Chay (1998), and Holzer (1998).

Parallel to these papers, we also document, using Turkish micro-level data, that smaller firms

[9]For example, Tansel (1996) is the first paper showing that this fact holds for urban male employees in Turkey but is not statistically significant for women. For studies documenting firm-size wage gaps at the country level, see, for example, Marcouiller et al. (1997) for El Salvador, Mexico, and Peru, Tan and Batra (1997) for Colombia, Mexico, and Taiwan (China), Brunello and Colussi (1998) for Italy, Hollister (2004) for the United States, and Lallemand et al. (2007) for Belgium, Denmark, Ireland, Italy, and Spain. Baker et al. (1988) document sectoral differences in size-wage gaps for CEOs. Meagher and Wilson (2004) and Fox (2009) find that the size-wage gap is larger for jobs with managerial responsibilities.

are more discriminatory against women than larger ones. However, we make an interesting additional point: the negative correlation between gender pay gap and firm size is only observed for informal employment and the gender pay gap is constant across firms of different sizes for formal employment. Our paper is the first in the literature documenting this fact. Section 4 discusses the details of our findings.

3 Data and Summary Statistics

In this study, we use the Turkish Household Labor Force Survey (THLFS) conducted by the Turkish Statistical Institute (TurkStat) for the years 2006–2012. This nationally-representative survey provides rich micro-level information on personal and work-related characteristics of survey subjects and it covers all private households who are living in Turkey.[10] The sample we choose from this dataset consists of private-sector wage earners of age 15-65.[11] We take 2012 as the base year and deflate the wage observations from 2006 to 2011 using the respective Consumer Price Indices. In other words, wages are measured in real terms and in 2012 prices.

In the THLFS dataset, information on firm size is collected based on employee responses to the question "how many workers are employed in the establishment where you are currently working at?" and the response is structured into 6 mutually exclusive size categories as follows: size 1 (1–10), size 2 (11–24), size 3 (25–49), size 4 (50–249), size 5 (250–499), and size 6 (500+). Since the degrees of freedom is low, especially for informal workers, in the largest size category, we collapse the 250–499 and 500+ categories into a single category. After this normalization, the largest size category in our analysis becomes the size-5 firm (i.e., the firm with 250+ workers). In unweighted terms, there are approximately 79,000 observations in this new category. Accordingly, we convert the size variable into 5 dummy variables, one for each size category.

We define an informal worker in relation to the worker's social security attachment, so the

[10] Except the residents of schools, dormitories, kindergartens, rest homes for elderly persons, special hospitals, military barracks, and recreation quarters for officers.

[11] We drop public sector workers because pay in the public sector determined by the job rank, which itself is determined by law rather than firm size.

worker is named formal if s/he is registered with the social security system and informal if not. The formality status of the worker is also reported in the survey by the question "are you registered with the social security system in your current job?" This will also be a dummy variable taking 1 if the answer is yes and 0 if not. Observe that this has nothing to do with the formality status of the firm; instead, we are interested in the formality status of the job.[12]

After putting together the 2006–2012 data and restricting the sample to private-sector wage earners, we have 585,769 observations in our unweighted sample; 446,416 of them are formal workers and 139,353 are informal workers. We also observe personal characteristics such as gender, education, age, marital status, and occupation; in addition to the work-related characteristics such as industry, wage, job status, and workplace size. Table (1) presents the summary statistics.

Age is represented as a continuous variable, which we restrict in our analysis to the working age, namely 15–65. The dummy variable for the marital status takes 1 if the person is married and 0 otherwise. Education is described by 6 categories: no degree, primary school, secondary school, high school, vocational high school, and college & above. To capture the geographical differences, we add 26 regional dummies in the NUTS-2 detail. Occupation is represented in ISSCO-88 classification and industry dummies are created following the NACE Rev.2 classification. The reported wage is the monthly earnings in the main job.

If we elaborate on some of the most important summary statistics, the share of informal workers is approximately 25 percent of the total employment, which makes Turkish data a natural laboratory to study informality-related employment issues. There are also several key empirical findings on the differences between informal and formal employment, which are worth noting. First, although the share of informality declines with firm size, it does not disappear completely and even the biggest firms employ some informal workers. Informality is higher for younger workers, while more educated workers are underrepresented in informal employment, as expected. Finally, the unconditional mean of monthly earnings for informal workers are about two thirds of that for formal workers. Therefore, from the raw data, we

[12] See Rauch (1991) for a classical theoretical discussion of informal versus formal firms.

can say that informal workers get lower salaries than formal workers, they are less educated, and their employment spells are shorter, on average, before controlling for observed worker characteristics.

4 Empirical Methods and Estimations

In this section, we briefly describe the empirical methods we use in our regressions, report our findings, and, then, discuss the results. Tables and figures are presented at the end of the paper.

4.1 The Firm-Size Wage Gap along the Formal-Informal Divide

Papers in the empirical literature estimate the firm-size wage gap based on the following standard regression equation:

$$\ln w_i = \alpha + \gamma L_i + \boldsymbol{\beta}' \boldsymbol{X}_i + \epsilon_i, \tag{4.1}$$

where $\ln w_i$ is the natural logarithm of wages, L_i is a dummy variable taking the value 1 if the firm is "large" and 0 otherwise, $\boldsymbol{X}_i$ is a vector of observed covariates for individual i, and ϵ_i is a random error term.[13] The coefficient γ is the firm-size wage gap. It is interpreted as follows: for example, if $\gamma = 0.25$, then observationally equivalent workers are paid, on average, 25 percent higher in large firms than in small firms. Note that this is a Mincerian wage equation modified for the purpose of estimating the firm-size wage gap.

Different from the simplified specification given in Equation (4.1), our "firm size" variable has five categories as we describe in detail in Section 3. We run two separate least squares regressions: one for formal employment and one for informal employment, conditioning on a large set of observed covariates. These covariates are as follows: firm size, gender, marital status, age (as a quadratic polynomial), education categories, job permanency, full-time/part-time work status as well as year, region, industry, and occupation dummies.[14] So, we control

[13] Note that the firm size variable has only two categories in this example for simplicity; but, this simplification comes without loss of generality and, in our estimations, firm size will have five categories.

[14] We are aware of the issue that larger firms may tend to be more productive and, therefore, pay higher wages to observationally

for all the relevant individual-level, group-level, and job-specific characteristics. Note that, in our regressions, we omit the dummy variable for the smallest size category (i.e., size 1); thus, the remaining firm-size coefficients should be interpreted relative to size 1. In other words, the coefficients of the size dummies from size 2 to size 5 describe relative premia of working in such firms versus working in a size 1 firm. Table (2) reports our estimates.

According to our estimates, the wage gap is 16.8 percent between the smallest and largest firms for formal employment, whereas it goes up to 26.7 percent for informal employment. Our estimates also suggest that the wage gap is a monotonically increasing function of firm size for both formal and informal employment. As the size of the firm gets larger, the wage gap increases at roughly constant rates both for informal and formal workers. However, the slope of this function is steeper for informal employment than formal employment. Figure (1) depicts this fact graphically.

The upper panel shows the wage gap as a function of firm size for informal and formal employment, separately. As the dashed trend lines suggests, the firm-size wage gaps have different slopes along the formal-informal divide. Specifically, slope is higher for informal employment than formal employment, which is reflected in the dashed plot on the lower panel. The term "differential size gap," mentioned in the y-axis of the lower panel, refers to the formal-informal differences in firm-size wage gaps.

In a companion paper [Balkan and Tumen (2013)], we try to explain the theoretical foundations of this slope differential. Specifically, we develop a two-stage wage-posting game with market imperfections and segmented markets, the solution to which produces wages as a function of firm size in a well-defined subgame-perfect equilibrium. The model proposes two distinct mechanisms.[15]

First, setting high tax rates on formal activity generates a wedge between formal and informal

equivalent workers. This means that firm size might be an endogenous variable in the size-gap regression (unobserved individual-level heterogeneity can also cause endogeneity). Since we are concerned with suggestive correlations rather than causality, we do not attempt to address this problem in this paper.

[15]The model draws on the simple wage-posting game developed by Montgomery (1991), Lang (1991), and Lang, Manove, and Dickens (2005).

size wage gaps. Thus, government policy can potentially affect the magnitude of the firm-size wage gaps. The model is able to explain the stylized fact through a second mechanism—even when the tax dimension is shut down. Higher wages offered by a larger firm for a formal job can attract a larger number of applicants than the same amount offered by the same firm can attract for an informal job. The larger pool of applicants for the formal job, in turn, enables the firm to keep the size differentials modest, while this mitigating labor-supply effect is weaker for informal jobs.

How the tax mechanism operates is obvious; however, the second mechanism might be more complicated to conceptualize. The second mechanism may be operating due to several reasons. First, larger firms, on average, may have greater skill requirements both for the formal and informal jobs they offer. However, informal jobs with higher skill requirements may fail to attract a large number of applicants, since skilled workers are expected to opt for formal jobs. Second, information on job opportunities in informal jobs are most likely disseminated through informal job search networks (such as relatives, friends, neighbors, and other acquaintances) rather than formal channels (such as ads). This can potentially reduce the size of the applicant pool for informal jobs. Finally, applicants may be valuing other job-specific (pecuniary and/or non-pecuniary) amenities along with pay. This kind of amenity packages are weaker in informal jobs, by definition. This weakness may itself lead to a smaller applicant pool in informal jobs, if the weight assigned to these side amenities are high enough.

In addition to the size coefficients, we would like to also comment on the other empirically relevant coefficients. As the education-related dummies suggest, returns to schooling are lower for informal workers. Relative to the workers with no degree, a college (and above) graduate makes 38 percent more in formal employment, whereas this number is as low as 22 percent in informal employment. Therefore, it looks like there is a mismatch of workers to firms in the informal sector, which results in ineffective use of the education they obtained. The idea of mismatch is elaborated further in Balkan and Tumen (2013).

4.2 Gender Gap, Firm Size, and Informal Employment

The estimation procedure for the gender wage gap is similar to that of the firm-size wage gap. The following Mincerian wage equation is generally used to estimate the gender wage gap in the literature:

$$\ln w_i = \alpha + \theta F_i + \boldsymbol{\beta}' \boldsymbol{X}_i + \epsilon_i, \tag{4.2}$$

where $\ln w_i$ is the natural logarithm of wages, F_i is a dummy variable taking the value 1 if the worker is female and 0 if male, $\boldsymbol{X}_i$ is a vector of observed covariates for individual i, and ϵ_i is a random error term. The coefficient θ is the estimated gender pay gap. We run 10 separate regressions for the formality status of the job and the size category of the firm; that is, we run separate regressions for formal and informal employment in each size category, controlling for the observed covariates. The results are presented in Tables (3), (4), and (5). To be specific, Table (3) reports the results for the 2006–2009 period, Table (4) reports the results for the 2010–2012 period, and Table (5) reports the pooled results. Note that only the coefficients of the "female" dummy are reported in these tables. The other coefficients are ignored for brevity. The control variables include marital status, age (as a quadratic polynomial), education dummies, job permanency, full-time/part-time work status as well as year, region, industry, and occupation dummies. Figure (2) visualizes our estimates.

Observe that the gender pay gap with respect to size is roughly constant for formal employment. The coefficients roughly vary between -0.10 and -0.12 in all regressions and this variation is of a negligible magnitude. Therefore, we calculate an average gender wage gap for formal employment approximately 11 percent in Turkey. On the other hand, informal employment displays a totally different pattern. In terms of the pooled estimates, the gender wage gap for informal employment is 24 percent in the smallest firms and around 11.5 percent in the largest firms. Moreover, we observe a monotonic decline in the informal gender gap as the firm size goes up. Notice that the informal gender gap in the largest firms is almost equal to the average formal gender gap.

Another interesting observation is that the informal gender gap in the largest firm-size category is much smaller than the formal gender gap in the post-crisis period—although it was larger in the pre-crisis period. This suggests that, based on data from the 2010–2012 period, the informal employment in the largest firms offer more egalitarian opportunities to women than formal employment in the largest firms. We conjecture that the underlying force behind this observation might be the implementation of employment subsidy programs in the post-crisis era in Turkish labor markets. Balkan et al. (2014) show that these programs have been effective in raising the employment probabilities of older women (i.e., women of age 30 or above) relative to the employment probabilities of older men. Employment subsidies might have triggered marginal informal female workers, who have been looking for formal jobs, to switch to formal jobs by reducing their costs to the employers. If this is the case, then the remaining informal female workers in the largest firms would only be the high-wage informal females, switching whom to formality would require a much larger incentive. As a result, a basic selectivity mechanism—which may have stemmed from the subsidy program—might be the underlying force.

Further theoretical and empirical implications of these results along with explicit links to labor market discrimination are discussed in detail by Akar et al. (2013). But there is one important point that needs to be emphasized. The literature suggests that the observed male-female pay differences are larger for informal jobs than formal jobs [see, e.g., Tansel (2000) and Tansel and Kan (2012)]. Assuming that the coefficient of the gender dummy in a Mincerian regression can be attributed to gender discrimination in the labor market, this means that informal jobs are more discriminatory against women. Our findings bring an interesting insight into this discussion. We show that informal jobs are indeed more discriminatory against women than formal jobs in small firms; however, in large firms, informal jobs are less discriminatory against (or more egalitarian toward) women than formal jobs, at least for a specific time period [see Figure (2)].

There is a well-documented fact that there are both "good" (i.e., upper tier) and "bad" (i.e.,

lower tier) informal jobs.[16] The two new facts we document in this paper might be suggesting that the "good" informal jobs are perhaps mostly offered by large firms and this might be reflected on the observed formal-informal differences in firm-size and gender pay gaps. Further information on job-related characteristics is needed to make more concrete statements on this issue.

4.3 Policy Implications

There are two interesting policy implications of our results: economic development and institutional forces. One of the main messages that our results communicate is that informal employment is a major cause of large wage differentials in an economy. However, this mechanism is also linked to the economy-wide size distribution. If there are many small firms and only a few large firms in the economy, and if there is widespread informality among small firms, then the size distribution of firms itself imposes large wage differentials. So the main question is whether informality or the size distribution is driving these differentials. It is well-known that the share of small firms—as well as the share of informal firms—decline along the development path. Therefore, the first policy implication may be that countries should not specifically focus on policies to reduce wage differentials; instead, the focus should be on economic development. Wage differentials (i.e., both gender and/or size gaps) would eventually become smaller as the economy grows further and a greater fraction of large firms starts operating. This result is a first-order implication of our estimates. Akar et al. (2013) discuss these issues in greater detail.

However, cross-country data suggest that wage differentials in some developed countries (such as the United States) are quite large; thus, high development levels alone may not be enough to shrink wage differentials. Then, institutional forces, e.g, the law-and-order factors, come into play. Labor market institutions such as minimum wage laws, unionism, and unemployment compensation schemes certainly affect wage differentials. That said, our paper is silent about these institutional factors and further research is needed to understand the link between the firm-size dimension of the economy and the labor market institutions.

[16] See, e.g., Fields (1990). See also Acemoglu (2001) for a theoretical discussion on good jobs versus bad jobs.

5 Concluding Remarks

In this paper, we document two new facts on the firm-size and gender pay gaps along the formal-informal divide. First, we show that the firm-size wage gap is larger for informal employment than formal employment. And, second, we find that the gender pay gap is independent of firm size for formal employment, while it is a decreasing function of firm size for informal employment. This is the first paper in the literature presenting the role of firm size on earnings gaps for formal and informal employment in a systematic way. We search for potential theoretical explanations for these facts in our ongoing work.

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	Formal		Informal	
Variable	**Mean**	**Std.Dev**	**Mean**	**Std.Dev**
Size 1	0.212	0.409	0.697	0.459
Size 2	0.126	0.331	0.121	0.326
Size 3	0.212	0.409	0.104	0.305
Size 4	0.275	0.446	0.063	0.242
Size 5	0.175	0.358	0.015	0.101
Female	0.234	0.424	0.245	0.430
Married	0.709	0.454	0.564	0.496
Full-time Job	0.983	0.131	0.923	0.266
Permanent Job	0.965	0.139	0.653	0.466
No Degree	0.015	0.123	0.117	0.321
Primary School	0.260	0.439	0.408	0.492
Secondary School	0.143	0.350	0.268	0.443
High School	0.141	0.348	0.093	0.290
Vocational High School	0.151	0.358	0.074	0.261
College & Above	0.290	0.454	0.041	0.199
Age	34.26	9.110	32.42	12.691
Log Real Wages (monthly)	7.054	0.526	6.408	0.593
Sample share	0.767		0.233	
# of Observations	446,416		139,353	

Table 1: Summary Statistics: This table describes the basic moments of the variables in our THLFS sample covering the period 2006–2012.

Dependent variable: Natural logarithm of monthly wages

	Formal		Informal	
Covariate	**Coefficient**	**(SE)**	**Coefficient**	**(SE)**
Size 1	omitted		omitted	
Size 2	0.067***	(0.0002)	0.121***	(0.0003)
Size 3	0.071***	(0.0002)	0.149***	(0.0004)
Size 4	0.112***	(0.0002)	0.197***	(0.0005)
Size 5	0.168***	(0.0002)	0.267***	(0.0010)
Female	-0.115***	(0.0001)	-0.217***	(0.0003)
Married	0.079***	(0.0001)	0.049***	(0.0003)
Full-time Job	0.299***	(0.0005)	0.676***	(0.0007)
Permanent Job	0.181***	(0.0004)	0.116***	(0.0004)
Primary School	0.0005	(0.0003)	0.007	(0.0004)
Secondary School	0.068***	(0.0003)	-0.003***	(0.0004)
High School	0.151***	(0.0003)	0.085***	(0.0005)
Vocational High School	0.167***	(0.0003)	0.083***	(0.0005)
College & Above	0.378***	(0.0004)	0.224***	(0.0008)
Age	0.046***	(0.0001)	0.044***	(0.0001)
$\text{Age}^2/100$	-0.048***	(0.0001)	-0.052***	(0.0001)
Year Dummy	Yes		Yes	
Region Dummies	Yes		Yes	
Industry Dummies	Yes		Yes	
Occupation Dummies	Yes		Yes	
Constant	5.471***	(0.0017)	5.470***	(0.0023)
# of Observations	446,416		139,353	
R^2	0.57		0.41	

Table 2: Results for Size Wage Gap Regressions. Size 1, male, non-married, part-time, temporary job, and no degree categories are the ignored dummy variables; so, the coefficients should be interpreted relative to these categories. Appropriate frequency weights are used. *, **, and *** correspond to 10 percent, 5 percent, and 1 percent significance levels, respectively.

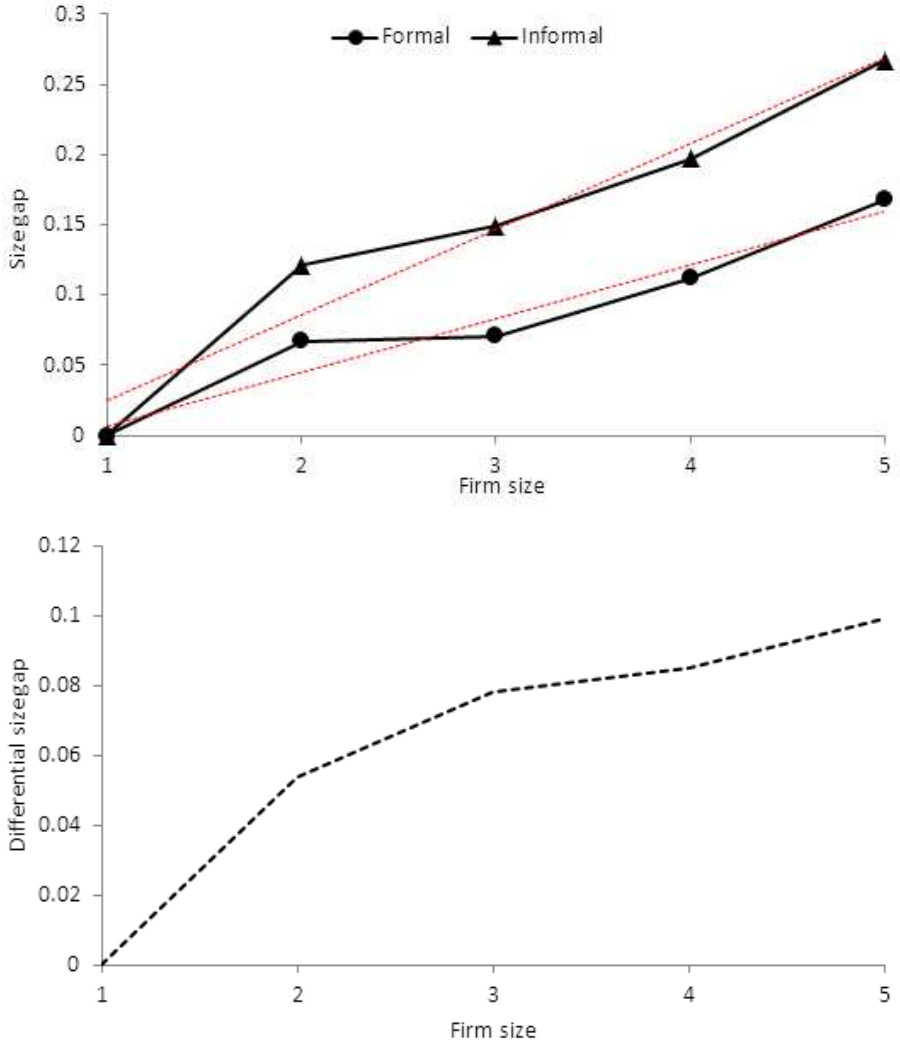

Figure 1: Plot of the size-gap estimates. The upper panel describes the firm-size wage gap relative to size 1 for both formal and informal jobs. For example, a typical formal job at a size 4 firm pays 11.2 percent more than a formal job at a size 1 firm, while this gap is 19.7 percent for a typical informal job. The red dashed lines are simply reference lines indicating the slope differential between the two black lines. To make this differential more concrete, the lower panel plots the vertical distance between the two lines in the upper panel. See Table (2) for the exact numbers used to construct the plots.

Dependent variable: Natural logarithm of monthly wages				
	Formal		**Informal**	
	Coefficient	**(SE)**	**Coefficient**	**(SE)**
Size 1	-0.096***	(0.0004)	-0.242***	(0.0006)
Size 2	-0.124***	(0.0005)	-0.163***	(0.0009)
Size 3	-0.116***	(0.0003)	-0.153***	(0.0009)
Size 4	-0.108***	(0.0003)	-0.149***	(0.0013)
Size 5	-0.105***	(0.0004)	-0.132***	(0.0035)

Table 3: Results for Gender Gap Regressions for 2006–2009: Estimation results for the gender pay gap based on 10 different regressions. Appropriate sampling weights are used in all calculations. *, **, and *** correspond to 10 percent, 5 percent, and 1 percent significance levels, respectively.

Dependent variable: Natural logarithm of monthly wages				
	Formal		**Informal**	
	Coefficient	**(SE)**	**Coefficient**	**(SE)**
Size 1	-0.112***	(0.0004)	-0.237***	(0.0007)
Size 2	-0.120***	(0.0004)	-0.172***	(0.0011)
Size 3	-0.103***	(0.0003)	-0.166***	(0.0011)
Size 4	-0.107***	(0.0003)	-0.153***	(0.0016)
Size 5	-0.110***	(0.0004)	-0.063***	(0.0034)

Table 4: Results for Gender Gap Regressions for 2010–2012: Estimation results for the gender pay gap based on 10 different regressions. Appropriate sampling weights are used in all calculations. *, **, and *** correspond to 10 percent, 5 percent, and 1 percent significance levels, respectively.

Dependent variable: Natural logarithm of monthly wages				
	Formal		**Informal**	
	Coefficient	**(SE)**	**Coefficient**	**(SE)**
Size 1	-0.106***	(0.0003)	-0.240***	(0.0004)
Size 2	-0.123***	(0.0003)	-0.164***	(0.0007)
Size 3	-0.109***	(0.0002)	-0.158***	(0.0007)
Size 4	-0.108***	(0.0002)	-0.150***	(0.0010)
Size 5	-0.107***	(0.0003)	-0.115***	(0.0025)

Table 5: Results for Gender Gap Regressions (pooled): Estimation results for the gender pay gap based on 10 different regressions. Appropriate sampling weights are used in all calculations. *, **, and *** correspond to 10 percent, 5 percent, and 1 percent significance levels, respectively.

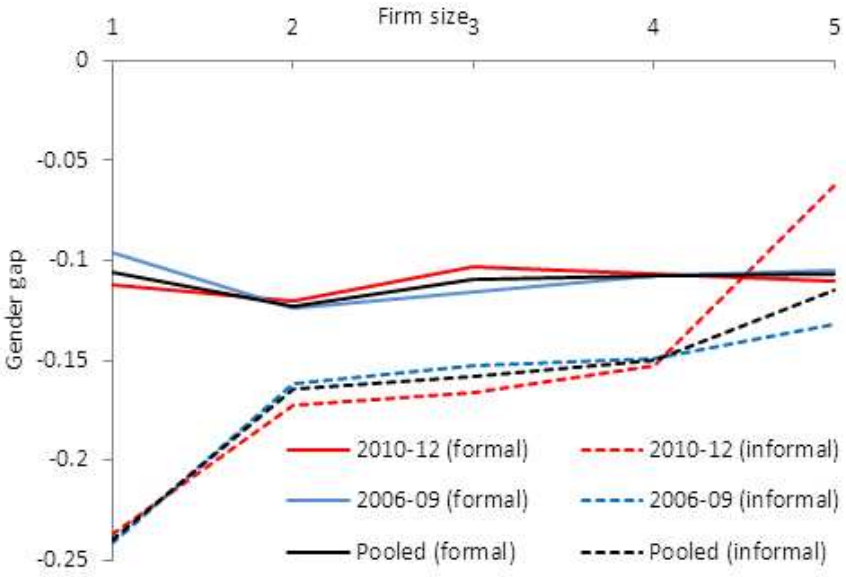

Figure 2: Plot of the gender-gap estimates: This figure describes the gender pay gaps as a function of firm size for both formal and informal employment. See Tables (3), (4), and (5) for the exact numbers used to construct the plots.