

Running Head: Contract Types and Wage Differences

WAGE PENALTY FOR TEMPORARY WORKERS IN TURKEY:
EVIDENCE FROM QUANTILE REGRESSIONS

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The paper estimates the wage gap between the employees with different contract types in Turkey. We first employ a quantile regression method and then decompose wage differentials along the distribution. Our results indicate that nonpermanent contract holders are more common among the low-skilled and low-wage group. While there is a wage penalty for having temporary contracts at the bottom end of the distribution, nonpermanent workers at the upper end also suffer from a wage gap in Turkey. The findings imply a non-monotone pattern in Turkey where both sticky floor and glass ceiling effects are observable. These effects are persistent over time as both bottom- and top-earner temporary workers are penalized, and the wage gap displays almost no change for each group. Also, from the quantile decomposition, we revealed that wage gap for low earners can be mainly attributed to the labor market characteristics. On the other hand, returns are primarily responsible for explaining the wage gap for high earners suggesting that they are subject to unfavorable conditions in the labor market.

Keywords: Temporary employment; Wage differentials; Decomposition; Quantile regression;
Contracts

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I. INTRODUCTION

Temporary contracts became very common both in developed and developing economies, especially among the younger and less skilled labor market participants. While there are various forms of nonstandard work ranging from agency employment to fixed-term contracts, their effects on labor market segmentation are rather similar. The coexistence of well-paid and secure jobs with insecure and low-wage jobs is believed to create dualization in the labor markets (Gordon, Edward, and Reich 1982; Lindbeck and Snower 2001). Heavy usage of temporary contracts and the associated flexibility is also argued to have negative impacts on productivity through volatility of employment during recessions (Dolado, Ortigueira, and Stucchi 2016). Even though few countries attempted to narrow down the gap between the temporary and permanent workers through reforms in employment protection legislation, still important differences exist and dualization continues to be a major issue given the involuntary characteristics of most temporary jobs.

In the literature, significant wage gap between temporary and permanent employees are well documented across many developed and developing countries. For instance, in Germany fixed-term contracts are disproportionately found among workers with very high qualifications and those with low qualifications. And those with high-wage fixed-term contracts earn only slightly less than permanent counterparts but those with low-wage temporary jobs earn much less (Mertens and McGinnity 2004). A similar result was obtained for Italy where the wage penalty is estimated to be larger at the bottom of the earnings distribution. However, the size of wage premium differs across countries and along distribution. It has been estimated that penalty for

temporary workers can be nearly 6.5% in the UK whereas it increases to almost to 20% in France (Booth, Francesconi, and Frank 2002; Blanchard and Landier 2002). There are only few studies estimating the impact of nonstandard contracts on wages and they find differing penalties for a set of Latin American and Asian countries. For example, Chile has a wage gap of 15% between permanent and temporary employees but the gap decreases to 4% in Peru (Maurizio 2016). Similarly, in Asia the wage differentials fluctuate, and are recorded to be 2% in the Philippines and 22.9% in Vietnam (Nguyen, Nguyen-Huu, and Le 2016).

Although there is agreement on the existence of a wage gap between temporary and permanent contract holders in the literature, the sticky floor versus glass ceiling effects are still empirically open questions. Both sticky floor and glass ceiling phenomena were originally used to describe the gap between female and male workers in terms of job allocations and ability to move upward in the job ladder. Later on, these concepts were adopted to define pay gaps and lack of promotion prospects at the bottom versus at the top of the wage distribution (Booth, Francesconi, and Frank 1998). When sticky floor is applied to the case of temporary workers, it implies that the wage differences across contract types will be larger at the lower end of the earnings distribution. On the other hand, glass ceiling for temporary workers mean larger pay gaps would be observed at the upper end of earnings distribution. Depending on the country, sticky floor and glass ceiling are both observed in the empirical literature. For example, it was found that the price differential is less at the upper end of the distribution in Italy (Bosio 201). The limited number of studies on developing countries generated varied results in terms of the effect of contract types on wages along distribution. While in Argentina and Vietnam the penalty decreases as we move from bottom to top earners, in Brazil and Pakistan the opposite impact is present since upper tiers get much lower wages than their permanent counterparts (Maurizio 2016; Nguyen, Nguyen-Huu, and Le 2016).

The effects of contract type on wage gap are much less studied for developing countries, and most of the existing research do not disentangle the relationship between temporary work and wages along the distribution. Our paper aims to first understand the magnitude of wage premium

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for permanent contracts in Turkey, which can be illustrative for other emerging economies. Second, it tests sticky floor and glass ceiling effects by looking at the impact of contract type on wages across quantiles. Lastly, the paper decomposes wage differential between permanent and temporary employees in Turkey into labor market characteristics and returns to examine the factors shaping the wage differences. We consider the issues of self-selection and endogeneity that could bias estimations as temporary employees might be voluntarily opting for these positions and unobservable individual characteristics can play a crucial role. Our results are similar to the findings in the literature since permanent contract holders on average have a major wage premium and temporary employment is more common among the low skilled and low earners. Also, we found that the effect of contract is higher both at the bottom and top of the wage distribution, indicating a non-monotone pattern in Turkey. Hence, both sticky floor and glass ceiling effects are visible in the Turkish case. Besides, we show that the impact of temporary contracts on wages have not changed throughout the period and both top and bottom earners with atypical employment are penalized in Turkey. Lastly, according to our decomposition results, wage gap can be explained by characteristics for the bottom quantile whereas it is mostly attributed to rewards for the top quantile.

In the next section, development of contract types in Turkey over time and across groups is briefly discussed. Also, models explaining the effect of contract type on wages are overviewed in the same section. The third section presents data used, descriptive statistics, and econometric methodology. In the fourth section, we look at the empirical findings based on quantile regression and decomposition techniques. And the final section discusses the implications of our results for labor market policy in general and for Turkey in particular.

II. CONTRACT TYPES IN TURKEY AND EFFECT ON WAGES

The definition of temporary and permanent contracts is varied across countries, which makes international comparisons rather difficult. In the Turkish case, workers whose main job is

occasional, casual, or seasonal; daily workers or other persons who depend only on an employer and do not work regularly and for unlimited duration; and on-call workers, are recorded as having temporary job. Permanent worker, on the other hand, is defined along the international classifications, and is considered to be anyone who has unlimited contract duration or has a regular job that lasts for 12 months and over (OECD 2002). Even though temporary work is very restricted on paper in the country, the employers are given the ability to transfer an employee to another firm. This is known as leasing and the firms engaging in leasing activities are called private employment agencies, which is similar to the temporary work agencies that are more common in Europe. Otherwise, temporary work agencies are forbidden in Turkey with the exception of agricultural work. This can be indeed deemed as the main factor for having rigid protection legislation and Turkey ranks at the top with regards to de jure measures towards nonstandard employment.

Not only the definition of temporary work is different between countries but also the legal and customary rules are distinct. In Turkey, flexible work arrangements are regulated by the seventh article of Turkish Labour Act no. 4857, which was enacted in 2003. According to the law temporary employment relationship needs to be for six months at most and can be renewed twice. Moreover, the employees are not given a statutory right to paid holidays but pensions, unemployment insurance, and paid leaves are recognized (Ekmekçi 2004). In Turkey, the minimum wage legislation is applicable to the atypical contract holders, yet they do not have the opportunity to be protected by the collective agreements, and are not explicitly covered by regulations to receive equal pay (Duman 2014). But the fixed-term contracts need to be justified on an objective basis such as the temporary character of the work or replacement of workers on leave. This is a peculiar condition that is not implemented in other OECD countries, yet European economies have other restrictions about which jobs be regarded as suitable for temporary contracts.

Turkey is still progressing in terms of the legal framework for the temporary workers, and currently the de jure employment protection legislation (EPL) is quite strong. EPL is constructed

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by taking three dimensions into account; employment protection of regular workers against individual dismissal; specific requirements for collective dismissals; and regulation of temporary forms of employment (OECD 2018). According to the EPL index, Turkey has a score of 4.88, which is the highest in the OECD sample pointing out that the temporary work is heavily regulated. Nevertheless, it should be remembered that there is not a big overlap between the de jure and de facto protection in Turkey as small firms are exempt from the regulations, and a large part of the employment is provided in such enterprises. Also, individual dismissals are relatively easy in Turkey, which contradicts the high EPL rankings of the country. Most of the protection is based on the severance pay that workers would receive in case of unfair dismissal, which is not applicable to most of the temporary workers. Lastly, Turkey has a substantial informal sector constituting more than 33% of the economy and none of the employers are subject to the regulations (SGK.gov.tr 2019).

In terms of the share of temporary workers, there are fluctuations over time mainly due to the changes in the agricultural employment. Like other developing countries, Turkey is going through economic transformation and agriculture's share in the economic output is declining. Given that atypical work arrangements are customary in agriculture, as its importance went down the incidence of temporary work also declined for some time in Turkey. Figure 1 presents the share of temporary employment and as can be seen, incidence of nonpermanent work increased throughout the 1990s reaching to 22% in 1999. Onwards, it started to decline and the decline continued until the crisis in 2004 with the lowest share of 8.3%. Since then, the share of temporary employment in Turkey is stable and according to the latest figure it is around 13.6%. This is quite comparable to a number of developing countries such as Argentina and Brazil, but it should be noted that there are several other emerging economies including India and Chile with much higher rates of temporary contracts.

<Figure 1>

While the overall nonstandard work arrangements in Turkey might appear to be lower than several other emerging economies, there are significant differences across genders. From Figure 2, it can be seen that the share of temporary employment follows the same pattern described as above. Recently, the incidence of temporary employment among male workers is getting higher than the female workers with 14.3% for the former and 11.9% for the latter. But these rates show the distribution of temporary and permanent contracts within each gender. If we consider the share of female workers in temporary employment, it can be observed that the incidence has gone up from 18.7% in 1998 to 25.8% in 2016. Together with the already low rates of labor force participation and employment of women in Turkey, a rise in the temporary positions might be contributing to gender inequalities. Besides, it has been shown that wage penalty is varied across male and female workers. For Britain, temporary male workers earn 16–17% less than their permanent counterparts as opposed to 13–14% reduction among women. Moreover, women are not penalized in their later career for holding a fixed-term contract but men are (Booth, Francesconi, and Frank 2002).

When we look at the share of temporary employment across age groups it can be observed that similar to many other countries the younger cohorts are more subject to the risk of having a fixed-term contract than prime age working group. This is mainly due to the lower experience and on-the-job-training of young employees as well as the higher likelihood of career development process to match skills and preferred locations (Nienhuser and Matiaske 2006; Portugal and Varejao 2010). Over the years the fluctuations are alike for the two groups, mostly reflecting the business cycles and the sectoral shifts. In 2016, the share of permanent jobs among 15–24 year olds was 70.9% while the same ratio was 89.6% for the 25–54 year olds (Figure 3). Nonpermanent contracts for the new entrants of labor market has been a widely observed phenomenon in developed and developing countries (Baranowska and Gebel 2010; ILO 2017). Even though the fixed-term contracts are more common among the younger workers in Turkey, the incidence is still lower with 29.1% than some of the other developed and developing countries such as Spain and Chile with 70.4% and 45%, respectively. However, the

unemployment rate among the youth is very high in Turkey suggesting a double problem; not finding a job at all or finding a job that is low quality.

<Figure 2>

<Figure 3>

Very similar results to the above described evolution of temporary contracts and its variation across gender and age groups can be reached using the survey data between 2004 and 2015. Appendix Figure 1 shows that incidence of nonpermanent contracts increased after the crisis in 2004 slowly and reached to 15.35% in 2015. From Appendix Figure 2, it can be seen that over this period, men started with lower share of temporary contracts; however it exceeded the female temporary employment in the 2010s and remained to be higher since then. With regards to the age distribution of nonpermanent contracts, Appendix Figure 3 supports the general findings in the literature as the incidence of temporary work is much more common among the 18–24 years old. The gap between this group and the prime age workers grew apart especially after 2008 and in 2015 the share of temporary employment among the 25–54 age group was recorded to be 12.33% versus 27.96% for the younger age group.

In general, the pay gap between the temporary and the permanent employees are attributed to the unbalanced protection of insiders at the expense of outsiders both through regulations and volatility of atypical jobs (Lindbeck and Snower 2001; Cahuc and Postel-Vinay 2002). High firing costs and greater unionization among permanent contract holders increase their bargaining power vis-a-vis temporary workers (Doerflinger and Pulignano 2015). In Turkey, it has been shown that union wage premium is high despite very low levels of unionization (Duman and Duman 2016). Unionization also brings nonwage benefits in Turkey such as more generous paid holidays, child care services, albeit limited, and social security coverage, which increases the likelihood of receiving a pension (Duman 2014). Hence, the ability of workers to organize can be

one of the reasons why permanent workers enjoy a wage premium and to a certain degree nonwage benefits.

Additionally, workers might be stuck at entry-level jobs and experience multiple unemployment spells, which further reduces their labor market prospects (Blanchard and Landier 2002). Even though temporary positions might be viewed as stepping stones and workers agree to lower wages for a probationary period, for majority of the temporary job holders, the probability of finding a permanent job is extremely low (Faccini 201). Thus, the stepping stone view of temporary contracts is not empirically verified and young and unskilled workers go through high risks and low earnings under fixed-term arrangements. Finally, the wage growth for temporary job holders is slower, which indicates that catching up is rather difficult but not necessarily impossible especially for skilled workers (Booth, Francesconi, and Frank 2002; Amuedo-Dorantes and Serrano-Padial 2007). All of these conditions are likely to generate significant differences between the pay scales of temporary and permanent contract holders. Furthermore, the wage gap can be greater at the bottom of earnings distribution where the majority of the unskilled workers are concentrated, which is also known as a sticky floor. However, it might be also possible to observe a higher wage gap at the upper end of the wage distribution, indication of a glass ceiling. Both of these hypotheses are tested for the Turkish case in the following sections.

III. DATA AND METHODOLOGY

A. Data and Descriptive Statistics

The main data source of this study is Household Labor Force Statistics (HLFS) collected by the Turkish Statistical Institute. A pooled dataset is formed for the period between 2004 and 2015, which includes the survey years that have a question on contract types. Overall, the dataset has more than 5.7 million observations covering all the regions in Turkey. Since we are

interested in the wage differentials between the temporary and permanent workers we exclude unpaid family workers, self-employed individuals, and individuals stated as employers in the survey. For the hourly wages we divide the net monthly earnings by the total hours worked in a month. The temporary workers are defined as anyone who is currently employed and has a nonpermanent contract. This is captured by a direct question in the surveys, which leaves us with 1,523,165 individuals. On the whole, almost 30% of the employees are in temporary jobs, and 80% of them declared not being able to find a permanent job as the main reason for being in a temporary job, and only 8% of them are voluntarily holding a fixed-term contract.

As can be seen from Table 1, there is significant difference between the genders in terms of their share in holding varied contracts. While nearly 40% of female workers have nonpermanent positions, this ratio is 26.34% for men. If we look at the age distribution, the younger and the older cohorts are more frequently employed in a temporary job whereas the prime age workers hold mostly permanent contracts. 37.74% of the individuals between the ages of 15–24 have temporary jobs and 80% of them have this type of employment involuntarily or are in a probationary period. Also, 57.78% of the older workers have nonpermanent positions, which amount to more than 81 thousand employees. In terms of education Turkey is similar to the other countries as the incidence of temporary work decreases from 30.34% to 12.83% when the person has a university diploma rather than less than primary school education. However, it should be also noted that people with a high school diploma has the largest share in temporary employment, which is more than 40%. Thus, we can say that the atypical work arrangements are disproportionately common among the unskilled individuals in Turkey.

Moreover, the majority of the part-time job holders, 58.9%, at the same time have temporary positions. This once again points out an issue in the Turkish labor market since employees are unable to find permanent and full-time jobs. As expected there are more temporary workers in small firms, and only 5.47% of the employees are under temporary contracts in firms with more than 50 employees. The share of permanent jobs is less in private sector in Turkey even though the fixed-term arrangements are rising in the public sector over the years. Yet, it is still around

7.3% in the public sector whereas the same ratio is nearly 45%. Finally, 70% of the temporary employees are not covered by a social security program, which might suggest greater disadvantages for nonpermanent contract holders as they penalized for wages and do not have access to typical labor market benefits. This also can be taken as another indicator for the size of the informal sector in Turkey.

<Table 1>

The summary statistics in Table 1 are replicated for 2004 and 2015 separately to identify any changes within these years. For all the categories including gender, age, education, and firm size, no important changes were observed. Since the survey question on public versus private sector employment began to be asked only after 2008, we were not able to include this variable in the new descriptive statistics. However, as can be seen from Appendix Tables A1 and A2, there are large jumps in the share of temporary employment among the part-time workers and worker who are not covered by social security in Turkey. While for the former group the incidence of temporary contracts increased from nearly 29% in 2004 to 52.3% in 2015, for the unregistered employees the same ratio went up from 24% to 44% over the same period. These developments indicate that the already vulnerable groups in Turkey became even more vulnerable over time due to the shifts in their contractual status. In addition to the controls in Table 1, occupation, industry, time and region dummies are used in the regressions to single out the effect of temporary employment on wages.

When we look at the wage distributions of the temporary and permanent workers we can observe that mean log hourly wages for the former group is 1.28, which is significantly lower than mean log hourly wages for the latter group with 1.74. Also, the distribution of wages between the two types of employees is quite distinct as can be seen from Figure 4. Even though both type of contract holders have distributions skewed to the left, the permanent workers are not as concentrated at the bottom end of the distribution as temporary workers. The lower wages are

much more frequent for temporary contract holders. Figure 5 shows the raw wages differentials between temporary and permanent workers at different earnings quantiles. It can be seen that pay gap is largest at the upper end of earnings distribution with more than 10 percentage points. The lowest earners also have a mean wage difference of 6.6 percentage points as well, which declines to slightly more than 1 percentage point for the second and third quantiles. The wage gap increases at the fourth quantile again, which clearly points out that looking at the mean wages would be insufficient to explain the effect of contracts for our sample. It should be noted that these are raw wage differences since none of the individual and firm level characteristics are controlled for. In the following section quantile regression method and corresponding decomposition technique are used to filter out the effects of several variables and estimate the correct wage gap between temporary and permanent workers across earnings distribution.

<Figure 4>

<Figure 5>

B. *Econometric Methods*

Given that temporary contracts have differential effects along the wage distribution and there are major differences between permanent and temporary contract holders, we employ a quantile regression technique (QR). While typical OLS estimation techniques only look at the mean effects of the independent variables, QR enables us to study the marginal effects of covariates on the dependent variable along the distribution (Koenker and Basset 1978). It involves the minimization of the weighted absolute values of the residuals and attempts to use all of the available data. In this sense, it offers a more complete picture about the linkage between the outcome variable and the regressors at different points of the conditional wage distribution

(Koenker 2005). w_i is the log wage of worker i . X_i is the vector of covariates representing the individual and firm level characteristics.

$$\widehat{Quant}_q(w_i|X_i) = X_i\beta_q, \quad q \in (0,1). \quad (1)$$

As shown by Koenker and Bassett (1978), the quantile regression coefficients, β_q , are estimated as the solution to the following minimization problem:

$$\widehat{\beta}_q = \underset{\beta}{\operatorname{argmin}} \sum_{i \in \{i: w_i \geq X_i\beta\}} [q|w_i - X_i\beta| + \sum_{i \in \{i: w_i < X_i\beta\}} (1 - q)|w_i - X_i\beta|]. \quad (2)$$

The interpretation of the quantile regression estimator is similar to the least square estimator where $\widehat{\beta}_q$ is the estimated return to the regressors at the q th quantile of the log wage distribution. In quantile regressions, the standard errors and confidence intervals for the coefficient estimates can be obtained by either using the asymptotic standard error of the estimator or by bootstrapping (Koenker 2005). Asymptotic standard error method assumes that the independent variables at each quantile are not correlated with the mean of the unobservables at that quantile. For example, in order to apply this technique having a temporary contract needs to be independent from the unobserved ability. Since these variables can be correlated, conditional quantiles might have heteroscedastic error terms which will lead to biased standard errors. To remedy for this, we employed bootstrap estimation of the standard errors with 100 repetitions. Estimates at the 10th, 25th, 50th, 75th, and 90th quantiles are presented, and for all estimations *bsqreg* command in Stata is used. This command estimates the model with bootstrap standard errors by assuming independent but not identically distributed errors; hence the standard errors in the model can be taken as equivalent to robust standard errors in linear regression.

We also take into account that self-selection by workers or sample selection by employers could lead to a nonrandom location of individuals according to the contract type. To control for

endogenous selection, the paper utilizes a similar approach to Heckman's (1979) two step procedure, which was modified by Buchinsky (2001) for nonparametric modes. A control function is used to correct for quantile regression estimates for sample selection. In the first step, the probability of employees holding a temporary contract is estimated by probit selection equations.

$$TC^* = \gamma_i' \mu + v_i, \quad (3)$$

where TC^* is a latent variable, γ is the vector of explanatory variables, μ is the coefficient to be estimated, and v_i is the error term for contract selection. γ vector includes variables looking at job search while being employed that is not part of the wage equation. In other words, the exclusion variable in this stage is a dummy variable based on the question in survey about job searching. If the person is employed and looking for a job, the dummy variable gets a value of 1 and 0 otherwise. This variable is constructed with the idea that employed temporary workers are more likely to be searching for jobs in comparison to employed permanent workers. It has been also used in several other studies examining wage gap in Italian labor markets (Picchio 2006; Bosio 201). In the second step, we calculate the inverse Mill's ratio from the above equation and use it as a variable in Equation (1). Lastly, to test for sensitivity to model specification, the square of inverse Mill's ratio and its third power are also employed in the regressions.

Once we estimate the QR coefficients we decompose the differences at selected quantiles of the wage distribution between two groups of workers. Blinder-Oaxaca decomposition technique is used to explain the wage differentials along two components; characteristics and rewards (Blinder 1973; Oaxaca 1973). The first component looks at the portion of wage gap between temporary and permanent workers that can be explained by the observable individual and firm-level attributes such as gender, age, education, experience, firm size, full-time position, and social security. The second component focuses on the wage gap that arises due to the returns on these characteristics and to what degree one group is treated more favorably in the labor market.

While the reward effect is generally understood as a measure of labor market discrimination, it indeed measures the unexplained component in wage differentials. Since Blinder-Oaxaca decomposition technique is based on the conditional mean model, it is not appropriate for quantile regressions. However, Melly (2005) proposed a more general approach where differences in characteristics and differences in returns can be estimated for nonlinear models. There are several procedures for the proposed decomposition, which includes estimating counterfactual wage distributions. For this purpose, we simulate the marginal wage distribution that would occur for temporary workers if all covariates have been distributed as permanent workers. Equation 4 presents the decomposition estimations, which is undertaken by *rqdeco* command in Stata.

$$\begin{aligned} \bar{q}_{P\pi} - \bar{q}_{T\pi} = & \overline{QR}(\log(w_P), \bar{q}_\pi) - \overline{QR}(\log(w_T), \bar{q}_\pi) = \\ & (\bar{X}_p - \bar{X}_T)\bar{\beta}_\pi + [(\bar{X}_p(\bar{\beta}_{P\pi} - \bar{\beta}_\pi) + (\bar{\alpha}_{P\pi} - \bar{\alpha}_\pi)) + (\bar{X}_T(\bar{\beta}_{T\pi} - \bar{\beta}_P) + (\bar{\alpha}_{T\pi} - \bar{\alpha}_\pi))]. \end{aligned} \quad (4)$$

In the above equation, β_π is the nondiscriminatory wage structure that is estimated from a pooled QR regression at quantile λ . $(\bar{X}_p - \bar{X}_T)\bar{\beta}_\pi$ captures the endowment effect and $(\bar{X}_p(\bar{\beta}_{P\pi} - \bar{\beta}_\pi) + (\bar{\alpha}_{P\pi} - \bar{\alpha}_\pi)) + (\bar{X}_T(\bar{\beta}_{T\pi} - \bar{\beta}_P) + (\bar{\alpha}_{T\pi} - \bar{\alpha}_\pi))$ captures the returns to these endowments in the market. For each quantile, the explained and unexplained components of the wage differential between temporary and permanent workers are then calculated.

IV. EMPIRICAL FINDINGS

As mentioned previously there are important wage gaps at the mean and across different quantiles between temporary and permanent workers. However, the raw differentials can be explained by individual characteristics and firm-related attributes such as age, education, industry, and size. Moreover, there can be endogenous selection that can bias the wage effects of contract types. Hence, in Table 2 the impact of contract type on wages is presented by

controlling for a range of possible explanatory variables. At the mean, temporary contracts decrease wages by nearly 9.5%, which is lower than many of the developed country premiums such as France and Germany where gap is estimated to be 29% and 26% but closer to Argentina and Brazil with 9% (Boeri 2011; Maurizio 2016). While not reported, different model specifications are utilized to check for robustness. The estimation coefficients are not altered by exclusion of industry and occupational dummies. Also, dividing the sample into various periods and running separate regressions for years did not affect the outcomes. The question about working in public versus private sector is asked only after 2008; however, estimating with this variable had no effect on the findings either.

The effect of contract type varies as we move along wage distribution and for the bottom quantile (10th) wage penalty for temporary employees is a little more than 6%. It decreases for the next two quantiles and then start to increase in the 75th quantile with 7.1%. The peak is reached at the upper tail of the wage distribution, 90th quantile where a temporary contract reduces wages by 8.3%. These findings indicate that there is glass ceiling in Turkey since the wage gap for the top quantile is higher than the rest of the sample. In that sense our findings are comparable to several other developing countries. It has been found that wage penalty goes up for high earners revealing glass ceiling effect in Pakistan and Indonesia (Nguyen, Ngyuen-Huu, and Le 2016). Similarly, in Brazil, Ecuador, and Peru glass ceiling effect can be observed (Maurizio 2016). However, it should be also noted that the employees with a temporary contract at the bottom quantile are still penalized in Turkey. This reveals that there is no monotone pattern as the wage gap is high both for the bottom and upper end of the distribution. Figure 6 shows the impact of employment type across quantiles and compares it to the OLS estimates with 95% confidence interval.

<Figure 6>

When we look at the other covariates, they appear to have the expected signs and they are statistically significant. As can be seen from Table 2, being a female worker decreases the wages across all quantiles in comparison to being a male worker. The coefficient is around 0.7% for the bottom quantile and remains to be around 0.8% as we move up the earnings distribution. However, gender coefficient is only significant for the 25th and 50th quantiles. Age is also positively related to the wages across the distribution, and its coefficient increases from 11% to more than 22% between 10th to 90th quantiles. For the lower and upper end of distribution, seniority appears to have comparable effects but it has more substantial impact on hourly wages in Turkey in the middle quantiles. In the 50th quantile, experience increases wages by 27%. Education displays an uneven pattern and having a greater degree raises wages more at the top end of wage distribution with 41% as opposed to nearly 18% at the bottom.

Remarkably, having a full-time job has the largest coefficient for the 90th quantile while it increases hourly wages in Turkey only by approximately 4% for the 10th quantile. This effect rises to nearly 53% at the top of the distribution. Firm size has a stable and significant relationship with wages across all quantiles as expected. Having social security registration, which is a good proxy for formal sector, provides a pay premium of 22.5% for the 10th quantile. While the magnitude of the coefficient decreases as we move up in the earnings distribution, it remains to be approximately 12% for the 90th quantile. Given the large size of informal sector employment in Turkey, the type of contract generates further problems. Workers that are not covered by social security are more likely to have nonpermanent jobs and each of these factors lower wages independently, putting informal sector and at the same time temporary employees in a highly disadvantageous status.

<Table 2>

Table 3 presents the quantile regression results after correcting for the selectivity bias applying the two-step method of Buchinsky. In the unreported first stage estimations, the

probability of having a temporary contract is identified conditional on a set of covariates and instrument (dummy for searching for a job). The inverse of derived Mill's ratios is used in the second stage quantile regressions to correct for endogenous selection. It can be seen that the coefficients on Mill's ratios are not significant for any of the quantiles. Moreover, the impact of contract type on wages is not altered by the control for selectivity bias. Still the workers at bottom end of wage distribution in Turkey receive lower wages, 5.8%, if they have temporary positions. There is a slight decline in the coefficient but significant levels remain the same with the previous models. After taking care of endogenous selection, glass ceiling effect is intact in Turkey and the wages of temporary workers at the upper tail of distribution are 9.1% lower than their permanent counterparts. Tables 4 and 5 replicate the same estimations for the beginning and end years of the survey, i.e., 2004 and 2015. It can be seen that there is no alteration in the relationship between temporary contracts and wages across the distribution. The bottom earners face a penalty of 6.1% and 7% in 2004 and 2015, respectively. While the negative impact of nonstandard employment declines for the next two quantiles, it increases afterwards and reaches to 7.5% in 2004 and 7.4% in 2015. The contract selection appears to be statistically insignificant in both years; hence the wage gap cannot be attributed to the employees' voluntary choice of temporary positions.

<Table 3>

<Table 4>

<Table 5>

The non-monotone relationship between type of contracts and wages in Turkey might be due to various reasons. On the one hand, the bottom quantile includes workers that have low wages and possibly low skills. The unemployment spells of temporary contract holders in this category can be expected to be more frequent and longer. Moreover, the bargaining power of low wage earners is typically less than the bargaining power of high wage earners. Given that temporary

employees are not covered by collective agreements in Turkey, this group is further disadvantaged. The apparent glass ceiling effect, on the other hand, can be more associated with temporary employees being unable to catch up as the growth in their earnings might be more punctuated than permanent employees. A number of previous studies found that the temporary jobs do not necessarily pave the way to permanent status. Given that the career advancements and climbing the ladder could be more substantial in determining the earnings at the upper end; this could be a reason for having higher wage gap across contract types.

The final step in our empirical investigation is the decomposition of wage differential between temporary and permanent employees according to labor market characteristics and returns to these characteristics. Table 6 presents the decomposition results with and without selectivity correction. For each quantile there is a statistically significant wage gap between the temporary and permanent workers. The total difference is around 0.378 log points for the bottom earners without selectivity correction and remains almost unchanged with 0.375 after contract selection is considered in the estimations. For the top earners, the wage gap is even higher and remains to be around 0.4 log points in each model. It is also evident from the table that labor market characteristics are more explanatory for the bottom quantile. While characteristics make up 44.4% of the total wage difference without selectivity correction at the 10th quantile, they also account for 48.3% of the total raw gap after endogenous selection is controlled for. On the contrary, rewards amount to nearly 85% and 82.5% of the total wage difference at the 90th quantile with and without selectivity correction, respectively.

These results are confirmed by the yearly decompositions run for 2004 and 2015 as well. Figure 7 plots the wage gaps throughout the period for the bottom and top ends of the distribution. In 2014, the wage gap for the bottom earners is found to be 0.312 log points and increased only slightly to 0.38 in 2015. Similarly, the difference between the temporary and permanent workers at the top quantile remained quite stable over time and went up from 0.42 to 0.46 log points between 2004 and 2015. It can be seen from Tables 7 and 8 that the characteristics account for more than 50% of the wage gap at the 10th quantile in both years. On

the other hand, the temporary workers at the 90th quantile receive lower wages than their permanent counterparts mainly due to the labor market rewards. For 2004 sample, nearly 81% of the gap is explained by the rewards and the same ratio is almost 87% for 2015 sample. Employees at the lower tail of wage distribution in Turkey receive lower earnings if they hold a temporary contract due to characteristics. Nonetheless, the workers at the upper end are subject to unfavorable returns even when they work full-time in large firms with social security coverage.

<Table 6>

<Figure 7>

<Table 7>

<Table 8>

V. CONCLUSION

The usage of flexible work contracts is increasing in Turkey, similar to many other developing and developed countries. Most of the temporary workers are unskilled and young, and they are relatively less protected by the legislative framework in comparison to the permanent workers. Indeed a large segment of the temporary employees in our sample was found to be unregistered to any social security program. Also, the possibility of holding a nonpermanent position is much greater for part-time workers. These suggest that the risks of atypical contracts in the country are heightened by other factors of vulnerability. Due to the less favorable conditions of temporary employment, significant wage differentials have been found between permanent and temporary workers across countries. Our findings reveal similar effects of atypical employment on wage determination. Temporary workers in each quantile earn less than their permanent counterparts in the Turkish labor market, and the negative effects are persistent over time.

However, there are also a number of specificities with regards to having a nonstandard work contract in Turkey. First of all, our quantile regressions showed that pay gap across the distribution differs for temporary contract holders. While the workers at the bottom end suffer a greater wage penalty, nonstandard employment is even more negatively related to wages at the highest quantile. The impact of temporary contracts and wages are lower at the middle range of the distribution on Turkey. This is quite different than many other countries where there is either sticky floor or glass ceiling. In Turkey, the pattern is non-monotone and employees with temporary positions both at the lower and upper tail of wage distribution are penalized. Moreover, the non-monotone relationship continues to exist for all the years suggesting that the impact of atypical contracts is not transitory. The decomposition results in our paper also showed that wage differences at the bottom end of earnings distribution can be largely attributed to the labor market characteristics. On the other hand, the returns to these characteristics are not explanatory for the lowest quantile but grow to be highly significant for the highest quantile. There is no alteration throughout the period with regards to the labor market characteristics being explanatory for the wage differences for bottom earners and the returns being explanatory for top earners over time.

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<APPENDIX>

TABLE 1

Share of Temporary and Permanent Workers

	Permanent (%)	Temporary (%)
Gender:		
Men	73.66	26.34
Women	60.61	39.39
Age:		
15–24 old	62.26	37.74
25–54 old	75.24	24.76
>54 old	42.22	57.78
Education:		
Less than primary	69.66	30.34
Primary	68.56	31.44
High	59.68	40.32
University and higher	87.17	12.83
Employment type:		
Full-time	74.26	25.74
Part-time	41.1	58.9
Size:		
< 10 employees	52.68	47.32
10–49 employees	85.81	14.19
> 50 employees	94.53	5.47
Sector: [*]		
Private	55.10	44.9
Public	92.67	7.33
Social security:		
Registered	95.96	4.04
Unregistered	30.05	69.95

Source: Author's calculations based on Household Labor Force Statistics (2004-15).

* Only asked after 2008.

TABLE 2

Quantile Wage Regression

	10th	25th	50th	75th	90th
Temporary contract	-0.061** (0.003)	-0.052** (0.002)	-0.039** (0.002)	-0.071** (0.003)	-0.083** (0.003)
Gender	-0.007 (0.012)	-0.009* (0.015)	-0.007* (0.013)	-0.002 (0.015)	-0.008 (0.015)
Age	0.110** (0.002)	0.127** (0.002)	0.158** (0.001)	0.206** (0.001)	0.224** (0.001)
Education	0.179** (0.0007)	0.222** (0.0006)	0.286** (0.0006)	0.384** (0.0006)	0.417** (0.0005)
Experience	0.019** (0.001)	0.025** (0.0009)	0.027** (0.0009)	0.023** (0.0009)	0.017** (0.001)
Firm size	0.115** (0.0007)	0.112** (0.0007)	0.112** (0.0007)	0.122** (0.0007)	0.131** (0.0007)
Full-time	0.040* (0.004)	0.184** (0.004)	0.396** (0.004)	0.499** (0.003)	0.527** (0.003)
Social security	-0.225** (0.003)	-0.175** (0.002)	-0.153** (0.002)	-0.118** (0.002)	-0.122** (0.002)
Industry	Yes	Yes	Yes	Yes	Yes
Occupation	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
R ²	0.26	0.21	0.22	0.26	0.27
# of observations	1,013,266	1,013,266	1,013,266	1,013,266	1,013,266

Note: The reference category is permanent employment. While not reported, all models include a list of control variables as per specification. QR models are estimated with bootstrapped standard errors. Standard errors are in parenthesis.

** and * denote statistical significance at the 0.01 and 0.05 levels, respectively.

TABLE 3

Quantile Wage Regression with Selectivity Correction

	10th	25th	50th	75th	90th
Temporary contract	-0.058** (0.003)	-0.049** (0.003)	-0.029** (0.003)	-0.068** (0.002)	-0.091** (0.002)
Gender	-0.008 (0.015)	-0.010** (0.01)	-0.008** (0.01)	-0.003 (0.015)	-0.006 (0.015)
Age	0.109** (0.009)	0.128** (0.009)	0.156** (0.009)	0.207** (0.009)	0.225** (0.008)
Education	0.178** (0.0004)	0.223** (0.0004)	0.284** (0.0004)	0.385** (0.0003)	0.419** (0.0003)
Experience	0.018** (0.002)	0.026** (0.002)	0.025** (0.002)	0.024** (0.002)	0.019** (0.002)
Firm size	0.114** (0.008)	0.113** (0.008)	0.110** (0.008)	0.123** (0.007)	0.133** (0.007)
Full-time	0.039* (0.009)	0.185** (0.006)	0.394** (0.005)	0.500** (0.005)	0.528** (0.005)
Social security	-0.226** (0.006)	-0.174** (0.006)	-0.155** (0.006)	-0.117** (0.006)	-0.120** (0.006)
Mill's ratio	-0.113 (0.12)	-0.044 (0.12)	-0.054 (0.12)	-0.087 (0.12)	-0.163 (0.11)
Mill's ratio square	-0.065 (0.11)	-0.012 (0.11)	-0.008 (0.11)	-0.044 (0.09)	-0.098 (0.1)
Industry	Yes	Yes	Yes	Yes	Yes
Occupation	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
R ²	0.27	0.25	0.32	0.33	0.31

of observations 1,012,897 1,012,897 1,012,897 1,012,897 1,012,897

Note: The reference category is permanent employment. While not reported, all models include a list of control variables as per specification. QR models are estimated with bootstrapped standard errors. Standard errors are in parenthesis.

** and * denote statistical significance at the 0.01 and 0.05 levels, respectively.

TABLE 4

Quantile Wage Regression with Selectivity Correction, 2004

	10th	25th	50th	75th	90th
Temporary contract	-0.061** (0.0104)	-0.044** (0.007)	-0.038** (0.007)	-0.059** (0.008)	-0.075** (0.006)
Gender	-0.01 (0.007)	-0.075** (0.012)	-0.075** (0.012)	-0.096** (0.008)	-0.054 (0.013)
Age	0.142** (0.006)	0.12** (0.005)	0.15** (0.005)	0.11** (0.007)	0.033** (0.006)
Education	0.029** (0.003)	0.032** (0.002)	0.074** (0.003)	0.17** (0.004)	0.12** (0.004)
Experience	0.007* (0.004)	0.041** (0.003)	0.126** (0.003)	0.258** (0.005)	0.153** (0.005)
Firm size	0.03** (0.003)	0.06** (0.002)	0.096** (0.002)	0.173** (0.003)	0.131** (0.004)
Full-time	0.15** (0.018)	0.19** (0.012)	0.24** (0.013)	0.34** (0.019)	0.52** (0.022)
Social security	-0.25** (0.018)	-0.19** (0.012)	-0.13** (0.012)	-0.069** (0.015)	-0.048** (0.014)
Mill's ratio	0.087	0.048	0.093	0.01	0.087

	(0.78)	(0.62)	(0.83)	(0.73)	(0.73)
Mill's ratio square	0.017	0.095	0.022	0.05	0.084
	(0.85)	(0.75)	(0.81)	(0.98)	(0.082)
Industry	Yes	Yes	Yes	Yes	Yes
Occupation	Yes	Yes	Yes	Yes	Yes
R ²	0.24	0.36	0.44	0.46	0.26
# of observations	73,236	73,236	73,236	73,236	73,236

Note: The reference category is permanent employment. While not reported, all models include a list of control variables as per specification. QR models are estimated with bootstrapped standard errors. Standard errors are in parenthesis.

** and * denote statistical significance at the 0.01 and 0.05 levels, respectively.

TABLE 5

Quantile Wage Regression with Selectivity Correction, 2015

	10th	25th	50th	75th	90th
Temporary contract	-0.07**	-0.05**	-0.02**	-0.06**	-0.074**
	(0.011)	(0.005)	(0.006)	(0.009)	(0.006)
Gender	-0.013*	-0.07	-0.08**	-0.094**	-0.086**
	(0.07)	(0.08)	(0.07)	(0.006)	(0.006)
Age	0.14**	0.1**	0.15**	0.046**	0.009**
	(0.008)	(0.004)	(0.005)	(0.008)	(0.007)
Education	0.041**	0.017**	0.032**	0.045**	0.027**
	(0.008)	(0.004)	(0.005)	(0.008)	(0.005)
Experience	0.02**	0.012**	0.083**	0.335**	0.143**
	(0.004)	(0.002)	(0.003)	(0.005)	(0.004)
Firm size	0.059**	0.057**	0.075**	0.128**	0.078**
	(0.003)	(0.002)	(0.002)	(0.004)	(0.003)
Full-time	0.148**	0.179**	0.38**	0.34**	0.77**

	(0.03)	(0.013)	(0.016)	(0.028)	(0.02)
Social security	-0.653**	-0.15**	-0.14**	-0.766**	-0.342**
	(0.04)	(0.02)	(0.022)	(0.038)	(0.026)
Mill's ratio	0.015	0.028	0.062	0.092	0.063
	(0.62)	(0.68)	(0.57)	(0.66)	(0.5)
Mill's ratio square	0.06	0.085	0.01	0.072	0.094
	(0.9)	(0.85)	(0.9)	(0.71)	(0.75)
Industry	Yes	Yes	Yes	Yes	Yes
Occupation	Yes	Yes	Yes	Yes	Yes
R ²	0.27	0.3	0.38	0.54	0.38
# of observations	97,330	97,330	97,330	97,330	97,330

Note: The reference category is permanent employment. While not reported, all models include a list of control variables as per specification. QR models are estimated with bootstrapped standard errors. Standard errors are in parenthesis.

** and * denote statistical significance at the 0.01 and 0.05 levels, respectively.

TABLE 6
Quantile Decomposition

	Without Selectivity Correction				
	10th	25th	50th	75th	90th
Raw differences	0.378** (0.005)	0.209** (0.005)	0.272** (0.005)	0.342** (0.004)	0.401** (0.004)
Characteristics	0.168** (0.023)	0.131** (0.023)	0.142** (0.019)	0.060** (0.025)	0.097** (0.025)
Rewards	0.210** (0.023)	0.078** (0.03)	0.129** (0.028)	0.282** (0.022)	0.304** (0.022)
	With Selectivity Correction				
	10th	25th	50th	75th	90th
Raw differences	0.375** (0.005)	0.203** (0.006)	0.274** (0.005)	0.339** (0.004)	0.4** (0.004)
Characteristics	0.181** (0.022)	0.133** (0.023)	0.14** (0.023)	0.051** (0.03)	0.092** (0.03)
Rewards	0.194** (0.021)	0.07** (0.03)	0.134** (0.021)	0.288** (0.021)	0.308** (0.02)

Note: Based regression includes all the control variables and decomposition is conducted by Melly (2005) estimator. Standard errors are in parenthesis.

** and * denote statistical significance at the 0.01 and 0.05 levels, respectively.

TABLE 7

Quantile Decomposition, 2004

	With Selectivity Correction				
	10th	25th	50th	75th	90th
Raw differences	0.312** (0.006)	0.3** (0.005)	0.25** (0.005)	0.36** (0.006)	0.42** (0.005)
Characteristics	0.19** (0.009)	0.16** (0.008)	0.14** (0.009)	0.14** (0.009)	0.09** (0.009)
Rewards	0.18** (0.008)	0.14** (0.008)	0.11** (0.009)	0.21** (0.02)	0.34** (0.03)

Note: Based regression includes all the control variables and decomposition is conducted by Melly (2005) estimator.

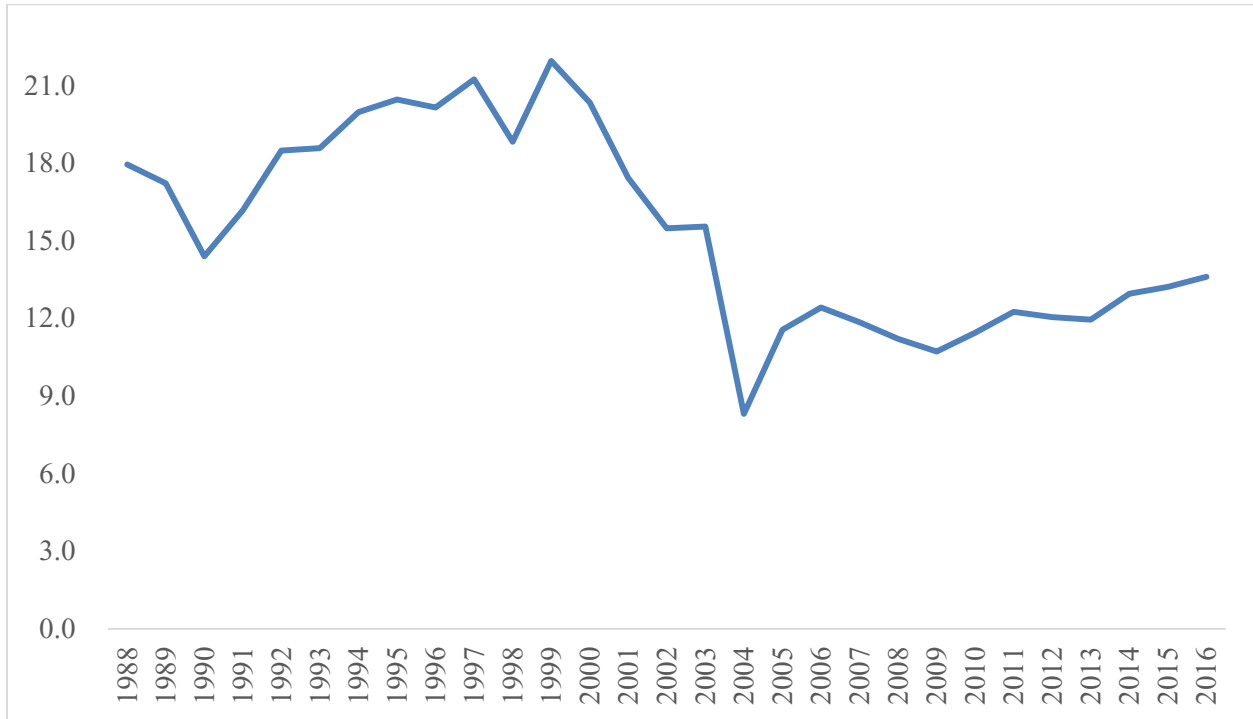
TABLE 8

Quantile Decomposition, 2015

	With Selectivity Correction				
	10th	25th	50th	75th	90th
Raw differences	0.38** (0.009)	0.28** (0.005)	0.24** (0.005)	0.34** (0.005)	0.46** (0.007)
Characteristics	0.18** (0.03)	0.17** (0.023)	0.14** (0.023)	0.1** (0.035)	0.08** (0.08)
Rewards	0.19** (0.03)	0.11** (0.023)	0.15** (0.023)	0.38** (0.05)	0.40** (0.09)

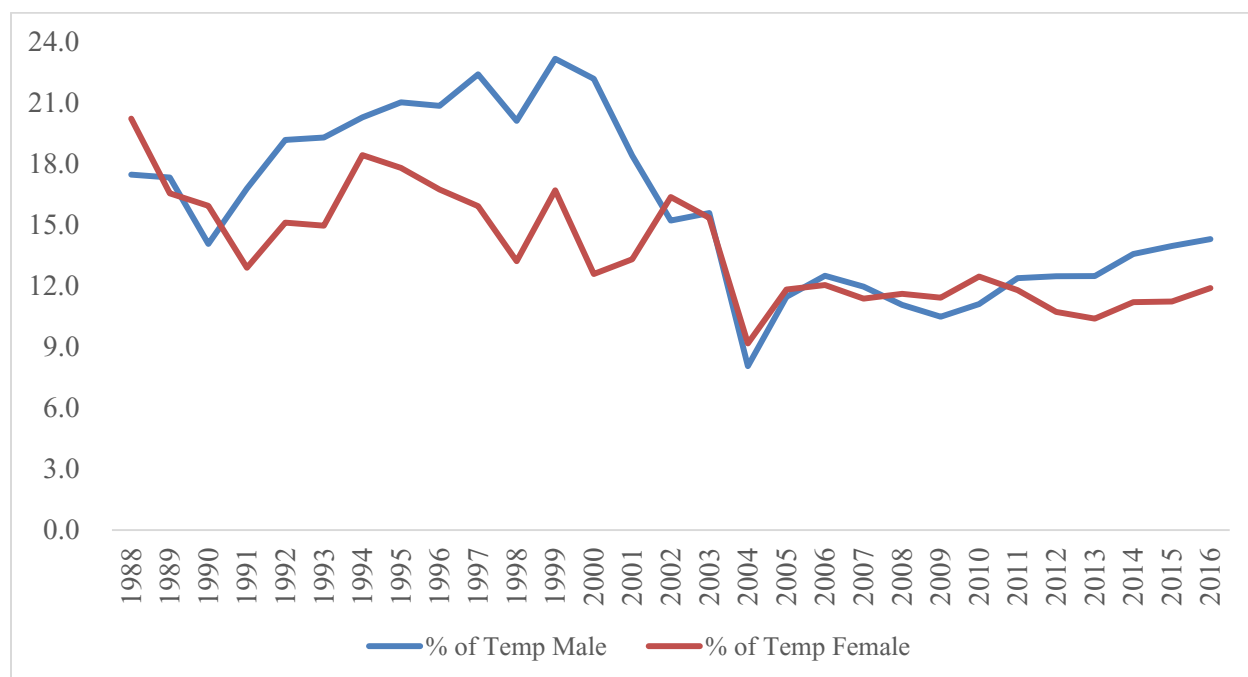
Note: Based regression includes all the control variables and decomposition is conducted by Melly (2005) estimator.

Fig. 1. Share of Temporary Employment in Turkey



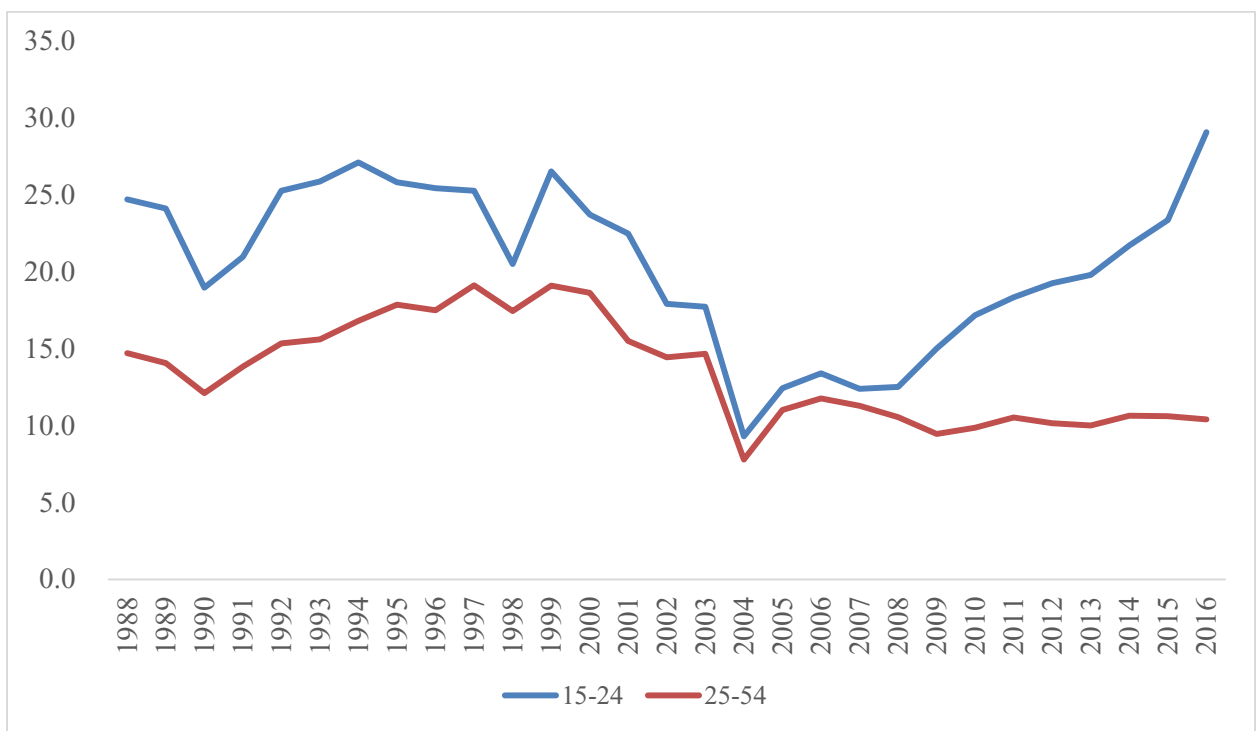
Source: OECD (2018).

Fig. 2. Incidence of Temporary Employment across Genders



Source: OECD (2018).

Fig. 3. Incidence of Temporary Employment across Age Groups



Source: OECD (2018).

Fig. 4. Log Hourly Wages across Contract Types

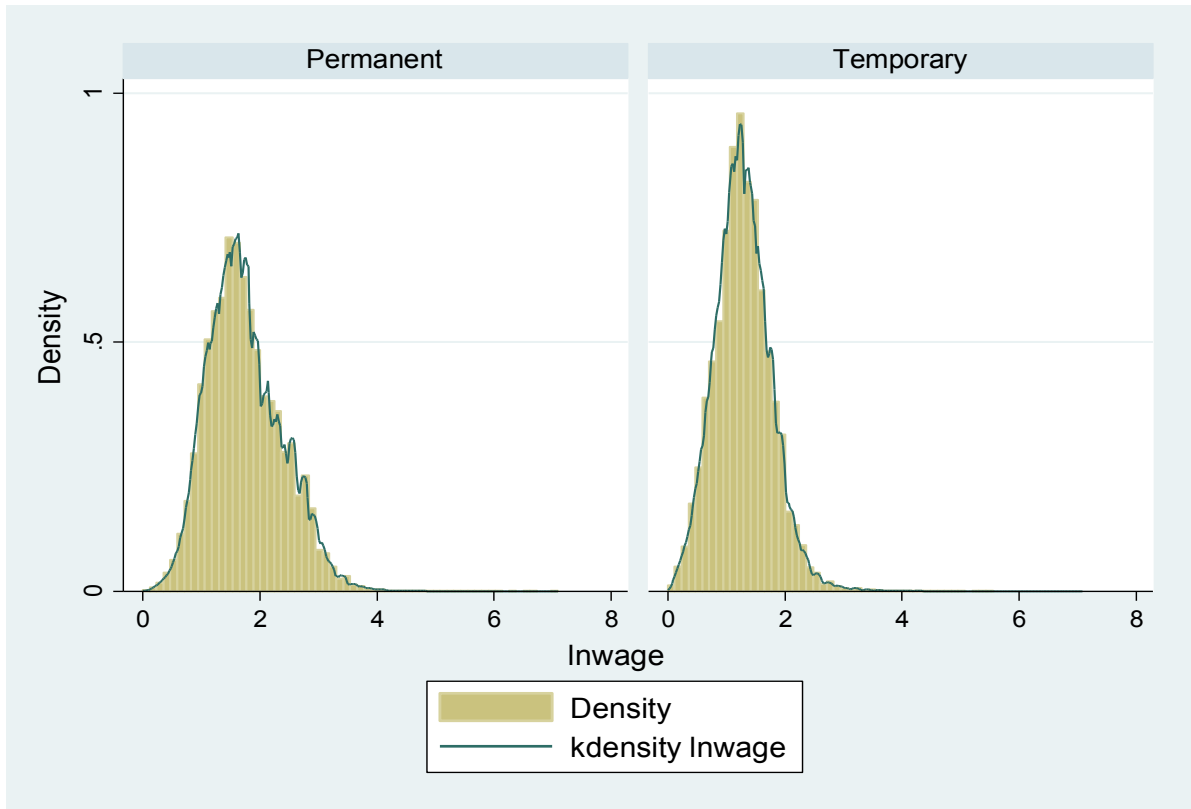


Fig. 5. Raw Mean Log Hourly Wage Differences across Quintiles and Contract Type

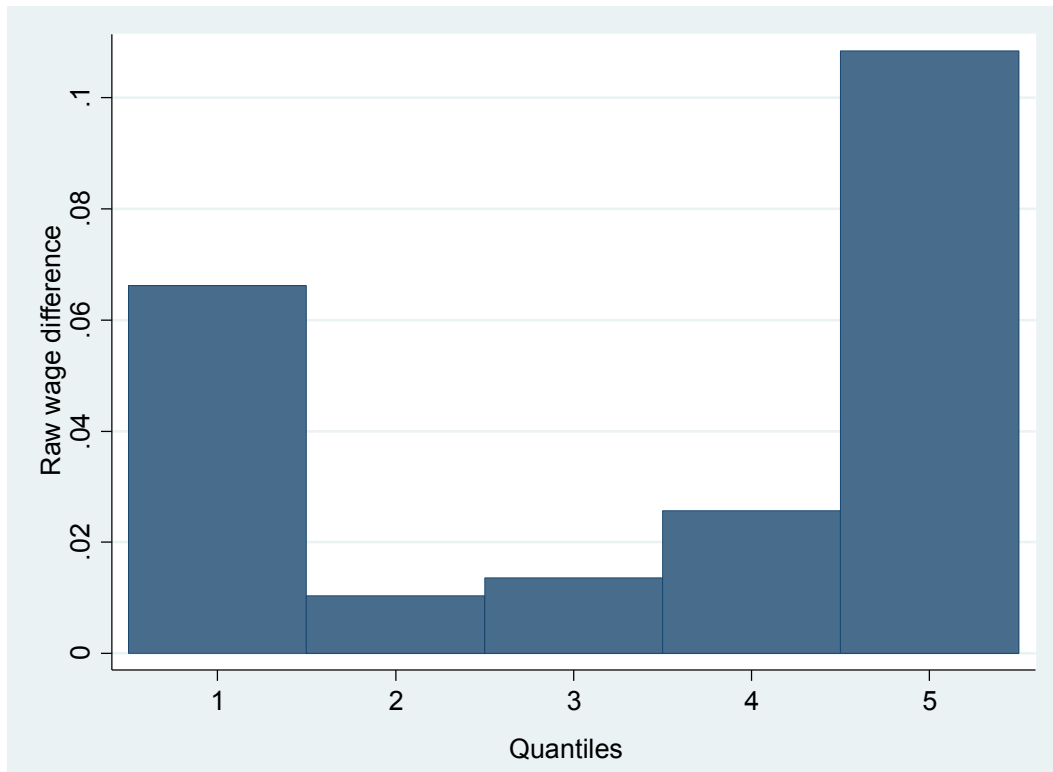


Fig. 6. Effect of Temporary Contracts on Wages across Quantiles and at the Mean

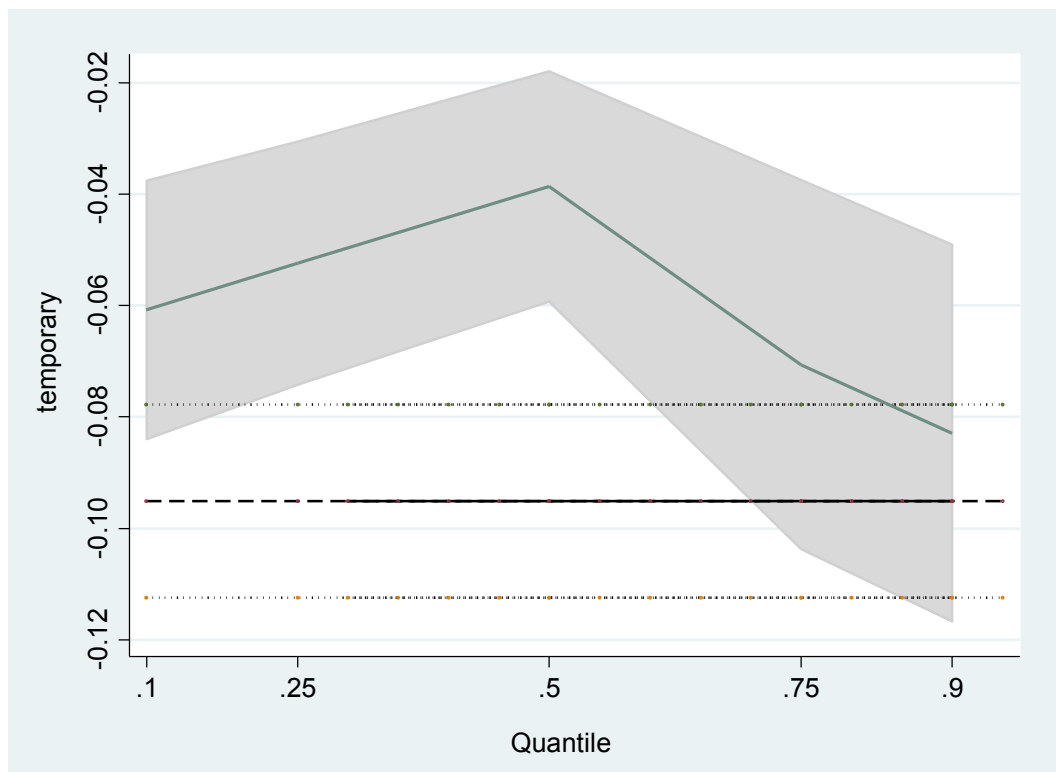
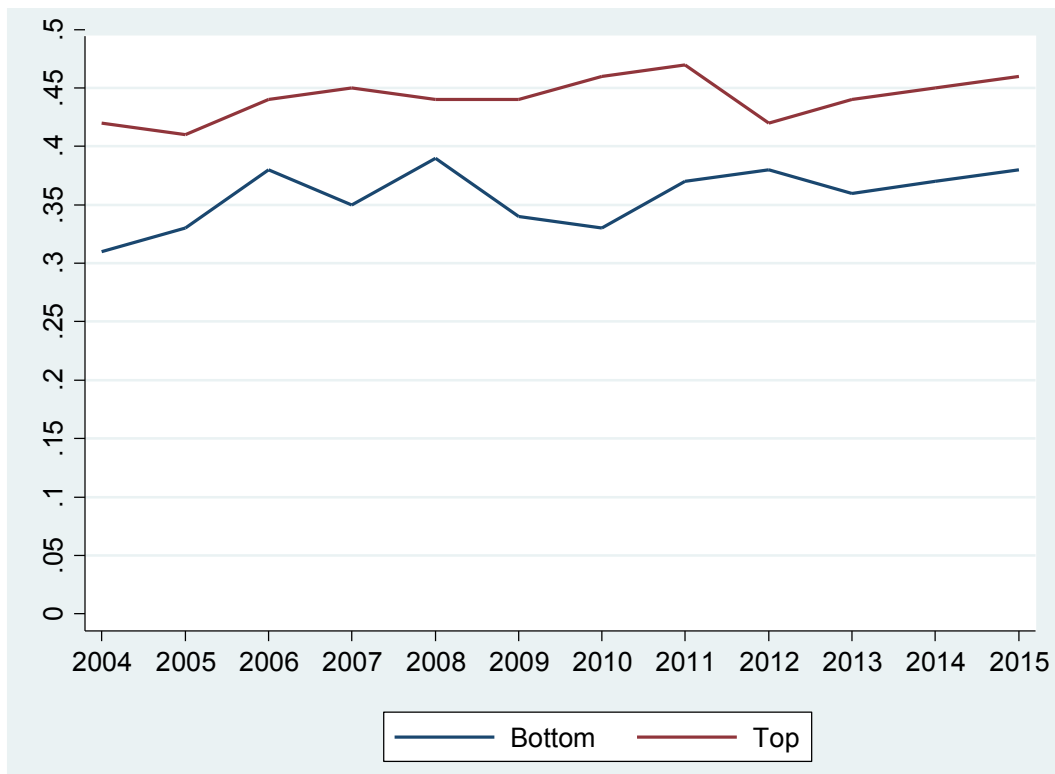
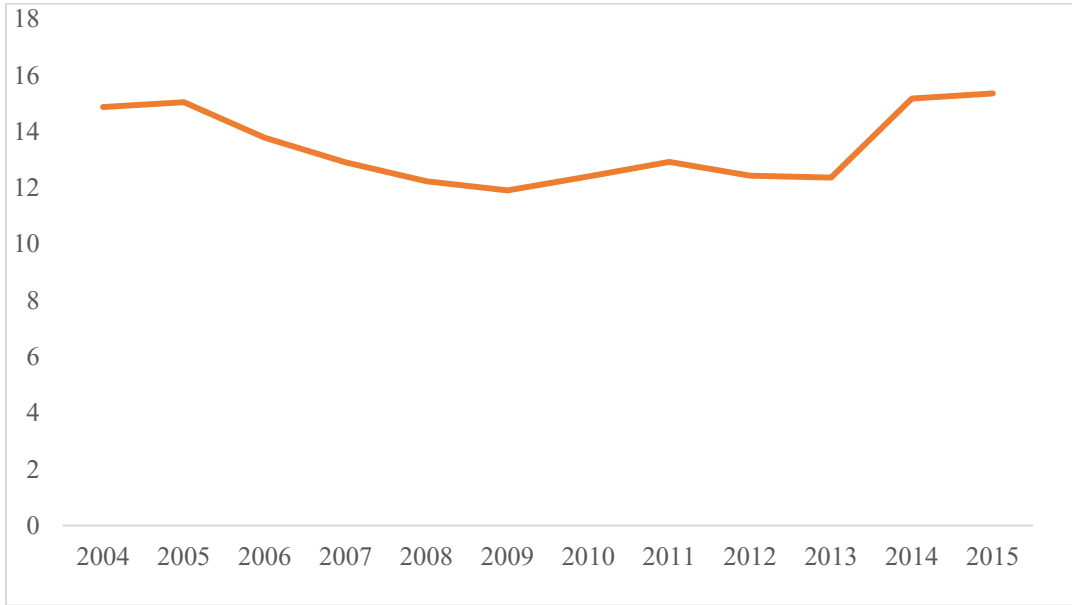


Fig. 7. Wage Gap between Temporary and Permanent Workers



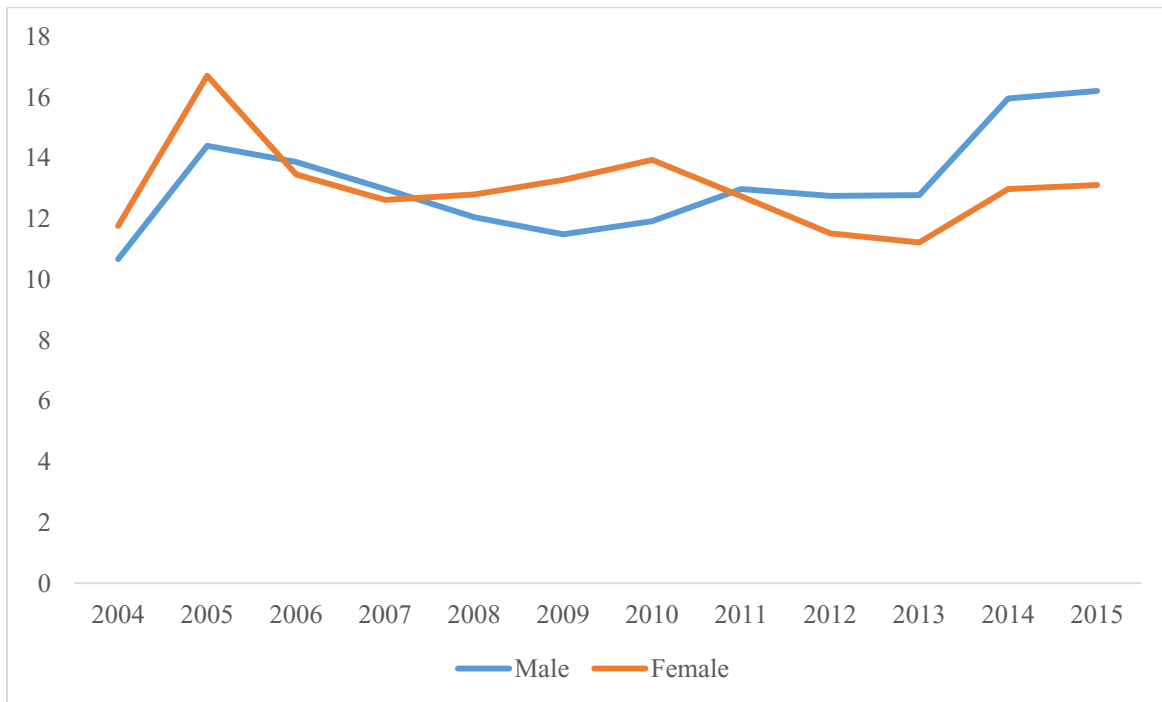
APPENDIX

Appendix Fig. 1. Share of Temporary Employment in Turkey, 2004-15



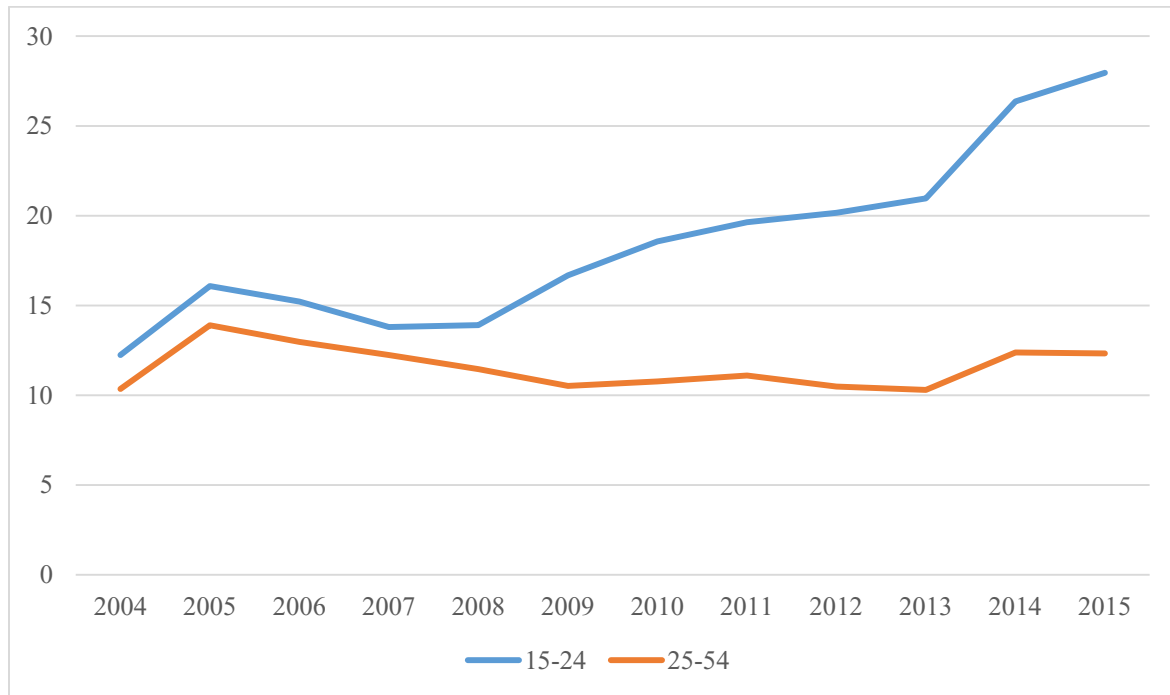
Source: Author's calculations based on Household Labor Force Statistics (2004-15).

Appendix Fig. 2. Incidence of Temporary Employment across Genders, 2004-15



Source: Author's calculations based on Household Labor Force Statistics (2004-15).

Appendix Fig. 3. Incidence of Temporary Employment across Age Groups, 2004-15



Source: Author's calculations based on Household Labor Force Statistics (2004-15).

APPENDIX TABLE 1

Share of Temporary and Permanent Workers, 2004

	Permanent	Temporary
Gender:		
Men	85.56	14.44
Women	83.29	16.71
Age:		
15-24 old	83.92	16.08
25-54 old	86.1	13.9
>54 old	77.77	22.23
Education:		
Less than primary	74.07	25.93
Primary	80.28	19.72
High	87.16	12.84
University and higher	92.93	7.07
Employment type:		
Full-time	85.82	14.18
Part-time	71.03	28.97
Size:		
< 10 employees	79.95	20.05
10-49 employees	90.54	9.46
> 50 employees	96.84	3.16
Social security:		
Registered	95.06	4.94
Unregistered	75.02	24.98

Source: Author's calculations based on Household Labor Force Statistics (2004).

APPENDIX TABLE 2

Share of Temporary and Permanent Workers, 2015

	Permanent	Temporary
Gender:		
Men	83.79	16.21
Women	86.89	13.11
Age:		
15-24 old	72.04	27.96
25-54 old	87.67	12.33
>54 old	78.75	21.25
Education:		
Less than primary	62.05	37.95
Primary	76.17	23.83
High	90.94	9.06
University and higher	96.55	3.45
Employment type:		
Full-time	86.66	13.34
Part-time	47.7	52.3
Size:		
< 10 employees	73.98	26.02
10-49 employees	87.64	12.36
> 50 employees	98.2	1.8
Social security:		
Registered	91.67	8.33
Unregistered	56.04	43.96

Source: Author's calculations based on Household Labor Force Statistics (2015).