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**SOCIAL NORMS AND FIRMS' DISCRIMINATORY PAY-
SETTING**

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SOCIAL NORMS AND FIRMS' DISCRIMINATORY PAY-SETTING

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January 22, 2013

Abstract

We analyze the relationship between gender-specific social norms and firms' pay-setting behavior. We combine information about regional voting behavior relative to gender equality laws, as a measure for gender-specific social norms, with a large data set of multi-branch firms and workers. The results show that multi-branch firms pay more discriminatory wages in branches located in regions with a higher social acceptance of gender inequality than in branches located in regions with a lower acceptance. Voter approval rates account for about 50% of the entire variation of within-firm gender pay gaps across regions. By investigating a subsample of performance pay workers for whom we are able to observe their time-based and performance pay component separately, we show that unobserved productivity differences within firms across regions cannot explain the relationship between social norms and within-firm gender pay gaps. As performance pay is more closely related to workers' productivity than time-based pay, gender-specific productivity differences would manifest in the workers' performance pay component. However, as the relationship between social norms and within-firm gender pay gaps manifests only for the time-based pay component but not for the performance pay component of the same workers, unobserved gender-specific productivity differences cannot explain our findings. The results support a strong relationship between social norms and the discriminatory pay-setting behavior of firms.

JEL-Classification: J31, J33, J71, M5

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I Introduction

Since the 1960's the majority of theoretical papers in labor economics investigating gender pay discrimination rely explicitly or implicitly on the intuitive idea that the gender-specific preferences of women or prejudice against women lead firms to pay discriminatory wages (e.g., Robinson, 1969; Becker, 1971; Black, 1995; Boal and Ransom, 1997; Bhaskar et al., 2002; Rosen, 2003; Hirsch, 2009; Manning, 2008). Recent theoretical and empirical papers, including Akerlof and Kranton (2000), Fernandez et al. (2004), and Fernandez (2011), argue and show that social norms relative to gender stereotypes shape the preferences, prejudices, and consequent behavior of individuals in the labor market. Combining both ideas leads to the hypothesis that social norms relative to gender equality mitigate the discriminatory pay-setting behavior of firms. However, no paper investigates whether social norms actually influence the pay-setting behavior of firms. This paper provides evidence for a relationship between social norms relative to gender equality and the discriminatory pay-setting behavior of firms.¹

Providing empirical evidence on the relationship between social norms and the discriminatory pay-setting behavior of firms is characterized by three major challenges that may partly explain why previous literature neglected to investigate this relationship. First, we have to measure social norms in a way that is representative for the labor market and reflects the individuals' true preferences rather than socially desirable responses such as, for example in surveys. Second, to separate the influence of social norms from other confounding factors, we need data that contains information on the pay-setting behavior of the same firms under the influence of different social norms, while other influences such as institutions, technological changes and economic conditions remain the same.² Third, we

¹We refer to discriminatory pay-setting as a situation in which women and men with the same productivity do not receive the same pay. Our criteria do not require prejudice or bias against women on the part of the employer.

²This is a common problem in studies where research attempts to identify the effects of social norms or culture by comparing the economic outcomes of different countries.

have to provide convincing evidence that the relationship between social norms for gender equality and the pay-setting behavior of firms is not a pure consequence of differences in unobservable gender-specific productivity differences.

To overcome these three empirical problems, we use voting data to on two amendments to the Swiss constitution on gender equality laws, and combine it with a data set of multi-branch firms. More specifically, to identify regional gender-specific social norms, we use information on regional voting behavior relative to two amendments to the Swiss constitution. First, we follow Lalive and Stutzer (2010) measuring social norms by using information on regional voting behavior relative to a 1981 amendment to the Swiss constitution on equal rights for women and men. One central part of this referendum states that women and men shall have the same rights and duties in the family and in the labor market. Second, we use information on regional voting behavior relative to a 2000 amendment to the Swiss constitution on the fair representation of women in federal authorities. Both referendum provide adequate measures of the degree to which voters challenge the traditional role model of women and men in society.

We combine this data with information on multi-branch firms that operate in different regions of Switzerland. In this way we are able to observe the pay-setting behavior of firms that are exposed to the same national institutional and regulatory standards (because they operate in the same country) but are exposed to the influence of differing social norms (because their branches are located in different regions with different social norms for gender equality). In this way we can ensure that we do not confound the effects of social norms with influences from different labor market institutions or the sorting of workers into different types of firms.

The most challenging difficulty is to provide evidence to prove that the relationship between social norms for gender equality and firms' pay-setting is not a pure consequence of unobservable gender-specific productivity differences. We provide an innovative solution to this problem by exploiting another specificity of our data. We are fortunate to

observe a subsample of workers on performance pay for which we are able to observe the time-based component and the performance pay component separately for the same worker. As time-based pay is often subject to bargaining³ between workers and firms, and performance pay is commonly tied to the workers' observed productivity, performance pay is more closely related to workers' productivity than time-based pay (e.g., Lazear, 2000a; Lemieux et al., 2009). This relationship allows us to apply an empirical proof by contradiction to show that the relationship between social norms for gender equality and the discriminatory pay-setting of firms is not driven by a relationship between social norms and unobserved gender-specific productivity differences. More specifically, under the assumption that the relationship between social norms for gender equality and pay is driven by regional gender-specific productivity differences, we have to find an effect of social norms on the performance pay component and on the time-based component of the workers' pay. In contrast, finding that social norms affect only the time-based component but not the performance pay component of the same worker would contradict the assumption that unobserved gender-specific productivity differences across regions are the cause for our results.

Our results reveal that—within the same firm—the gender pay gap is larger for branches in regions where social norms are more likely to tolerate gender inequality—i.e. where fewer people approved the equal rights amendment— than in regions where social norms are less likely to tolerate gender inequality. Indeed the variation in social norms can explain about 50% of the within-firm variation in the gender pay gap.

Separate analyses for the time-based and performance pay components on a subsample of workers receiving performance pay show that firms' pay-setting behaviors vary according to regional differences in social norms only with regard to the time-based component

³Hall and Krueger (2010) report, for example, that a substantial amount of workers in the USA bargained over pay before accepting their jobs. Wage bargaining is particularly important for highly educated workers that do not work in the government jobs or in jobs that are covered by tariff contracts. As our sample consists mostly of white collar workers in the private sector and as labor unions and tariff contracts are very rare in Switzerland it is most likely that there is a substantial amount of bargaining between workers and firms.

of pay. Therefore, our results contradict the argument that differences in the firms' pay-setting behavior are driven simply by within-firm regional productivity differences among women and men, and support the hypothesis that social norms for gender equality mitigate the firms' possibilities for setting discriminatory wages.

By showing a relationship between social norms and the discriminatory pay-setting behavior of firms, we contribute to two strands of literature. First, our results contribute to the literature on gender pay gaps. Previous papers show that pay differences remain substantial even after controlling for a large number of observable productivity-relevant characteristics (e.g., Altonji and Blank, 1999; Blau and Kahn, 2000, 2006). This article provides evidence for a novel explanation by showing that social norms for gender equality influence firms' discriminatory pay-setting. Therefore, our work relates to papers investigating explanations for the persisting unexplained part of the gender pay gap which do not rely on gender-specific productivity differences but instead focus on social factors such as prejudice, preferences, expectations, and personal traits (e.g., Clark, 1997; Dohmen et al., 2010; Gneezy et al., 2003; Donohue and Heywood, 2004).

Second, our results also contribute to the growing literature investigating the relationship between social norms, culture, and economic outcomes. Previous studies show that social norms and culture affect the behavior of individuals. Alesina et al. (2011) find, for example, that individuals with stronger family ties are less mobile and have lower wages. Fernandez (2007) shows that cultural roots affect the labor supply of second-generation female immigrants. Ichino and Maggi (2000) demonstrate that regional differences in individual preferences influence the frequency of absenteeism and misconduct. We add another insight to this field of research by showing that social norms influence the behavior of firms, too.

The remainder of the paper is organized as follows: Section II briefly describes the theoretical literature. Section III provides a conceptional framework that guide the interpretation of our results. Section IV presents the empirical model. Section V describes the

voting and the firm data. Section VI presents the estimation results. Section VII concludes.

II Why should social norms influence the discriminatory pay-setting behavior of firms?

To explain why social norms on gender equality influence the discriminatory pay-setting behavior of firms, we combine two arguments that are already established in the literature. First, we refer to the literature that investigates how gender-specific preferences and the prejudices of employers and workers result in a persistent gender pay gap. Second, we refer to papers investigating how social norms transmit into individual preferences and influence the behavior of people.

The first strand of literature has tried to understand how preferences in the form of prejudice against women or differences in gender-specific preferences for job characteristics result in a persistent gender pay gap. The first to incorporate the prejudice into an economic analysis of discrimination was Becker (1971) who argued that some employers have costly prejudices against minority workers and therefore only will hire minority workers at a wage rate below their productivity. However, as Arrow (1972) in his well known critique of Becker suggests, employers with costly prejudices will be driven out of competitive labor markets. Therefore, several papers extend the work of Becker (1971) by incorporating market frictions into their models. Black (1995) and Rosen (2003), for example, develop equilibrium search models with prejudiced employers or managers. Those scholars rely on the idea that some prejudiced employers or managers in the market reduce the outside options for women by influencing the number or quality of outside offers. They show that equilibriums exist in which both prejudiced and unprejudiced firms pay lower wages to women even if only a few prejudiced employers are in the market.

A related strand of literature does not posit that the employers have prejudices against women but rather assumes that women and men differ in their preferences for job char-

acteristics and household responsibilities. For example, in contrast to men, women might be more likely to favor jobs that are closer to their homes or have flexible working hours, so that they are able to combine their household responsibilities with their working life. Such preferences might disproportionately increase the mobility cost of women or might reduce the number of possible job choices. Consequently, if labor markets are not fully competitive, gender-specific preferences disproportionately reduce the value of women's outside options and thus allow firms to pay women lower wages than men. Most of these models rely on monopsony type frameworks, and references to these kinds of ideas can be found in studies such as Robinson (1969), Boal and Ransom (1997), Bhaskar et al. (2002), Manning (2008) and Hirsch (2009). Independent of the differences in precise mechanisms of those models, they all rely on the intuitive idea that all firms will pay discriminatory wages under market frictions if men and women differ in their preferences.

The second strand of the literature has established that social norms affect the preferences of individuals. Akerlof and Kranton (2000), for example, incorporate persons' identity into a utility framework. They argue that individuals receive utility gains when acting in line with the social prescribed behavior of their identity category or suffer utility costs if they are not. For example, they argue that a woman might violate the prescribed behavior of her identity, if she refuses to be the main responsible for household and kids but would work in a full time job instead. In Akerlof and Kranton's terms such a behavior would impose a utility cost on the women either because she is violating her own identity and suffering by not feeling stereotypically female or because she is violating the identity of her husband who has identity-related preferences for a stereotypical housewife or who might refuse to undertake a major part of the household work. In this fashion Akerlof and Kranton (2000) offer a plausible explanation of why even those women with full-time jobs are still responsible for the lion's share of the household work. In the same way Akerlof and Kranton (2000) give a plausible reason for social norms possibly translating into employer prejudices or costly tastes for discrimination—i.e., employers or coworkers might

experience a threat to their personal identity if they have to work with women.

Related papers develop models and provide evidence to explain how social norms are transmitted into preferences and handed down from one generation to the next. Fernandez et al. (2004), for example, develop a model in which working mothers influence their son's preferences and ideas about stereotypical gender roles. The working mother's sons in turn influence the behavior of their wives. Additionally, Fernandez et al. (2004) provide empirical evidence that sons of working mothers are more likely to live with working women. Other examples of studies that investigate the influences of social norms but are not related to investigations of gender-specific behavior are Fisman and Miguel (2007) and Guiso et al. (2004). Independently of how social norms are transmitted from one generation to the next, the literature agrees that a strong relationship between social norms and individual preferences exists. Moreover, these social preferences are often likely to impose behaviors that are in conflict with economic incentives.

Combining the idea that social norms for gender equality influence the preferences of women and men with the idea that gender-specific preferences mitigate the firms' discriminatory pay-setting behavior, leads to our hypothesis that social norms influence the firms' discriminatory pay-setting behavior.

III A proof by contradiction

The aim of this paper is to investigate the relationship between social norms on gender equality and the discriminatory pay-setting of firms. The main challenge in showing this relationship is to provide evidence that firms do not only set their wages according to gender-specific productivity differences but may also pay different wages for individuals of the same productivity. This section provides a conceptual framework that allows us to apply an empirical proof by contradiction to show that the relationship between social norms on gender equality and the firms' pay-setting behavior is not a consequence of

gender-specific productivity differences. The most obvious way to guide our empirical investigation is to think within a classical bargaining framework.

First, we investigate how firms set their pay for workers that work in the same firms and presumably in the same jobs. A wage-posting model—in which wages are set before workers and firms match—would make it difficult to explain why women and men would receive different wages if working in the same firm and job (e.g. Hall and Krueger, 2010). Second, to learn whether social norms actually influence the discriminatory pay-setting of firms, our investigation hinges on the investigation of two types of pay—time-based and performance pay—that differ mainly in their scope for bargaining. Thus to guide our empirical investigation, we depart from a very simplistic static Nash bargaining model in the form of equation (1). Our model resembles the model of Hall and Lazear (1984) to some extent. However, for the purpose of clarifying our estimation strategy a model in which workers are risk-neutral and firms and workers have symmetric information is sufficient.

$$(p_i - w_i)^{(\alpha)}(w_i - E(b_i))^{(1-\alpha)} \quad (1)$$

The Nash bargain is represented by equation (1) with $i \in [f, m]$ with f for female and m for male. α denotes the bargaining power of the firm. w_i denotes the worker's wage. p_i represents the productivity of the worker in the firm, and $E(b_i)$ denotes the expected value of the worker's outside option at another firm or of staying at home. $E(b_i)$ depends on the quantity and quality of the worker's job offers or the value of staying at home but also on how firms and workers evaluate the value of these outside options. The maximization of this asymmetric Nash bargain leads to the wage:

$$w_i = (1 - \alpha)p_i + \alpha E(b_i) \quad (2)$$

Thus we can write down the gender pay gap as:

$$w_f - w_m = (1 - \alpha)[p_f - p_m] + \alpha[E(b_f) - E(b_m)] \quad (3)$$

For the purpose of this section considering the two extreme cases where either the employer or the worker have the entire bargaining power will suffice. The first case, in which the employer has all the bargaining power, refers to the special case where $\alpha = 1$. Thus equation (3) collapses to:

$$w_f - w_m = [E(b_f) - E(b_m)] \quad (4)$$

In other words, the model implies that a rational employer with all the bargaining power would always choose a wage that matches the expected outside option $E(b_i)$ of the worker. The rational worker would accept this wage offer because the worker is indifferent between the wage offer and the expected value of his or her outside option.

The second case is the situation in which the worker has all the bargaining power. This situation represents the special case where $\alpha = 0$. Thus we have:

$$w_f - w_m = [p_f - p_m] \quad (5)$$

If the worker has all the bargaining power, the worker would be able to increase his or her wage up to the point where the wage matches his or her marginal productivity. Consequently, if the workers have all the bargaining power gender-specific productivity differences are the only determinant of the gender pay gap.

In the case of performance pay, we think of a situation in which the employer and worker have an upfront agreement tying the wage to the workers' productivity. As the employer and the worker agree upfront about how the worker's productivity is related to the workers' performance pay component, we can think of this situation as one in which the employer has no scope to bargain. Specifically, under an efficient performance pay

contract and observable productivity, the worker's wage equals his or her marginal productivity.

In the case of time-based pay the firm and the worker do not have an upfront agreement as time-based pay usually leaves room for salary negotiations. Specifically, if workers have no voice (i.e. institutions such as labor unions or works councils), assuming that the employer has all the bargaining power is plausible.

As it is plausible to assume that the employers' bargaining power is lower under performance than under time-based pay, the model implicates that the gender pay gap under performance pay component is stronger determined by the productivity differences between women and men, whereas the gender pay gap under the time-based pay component is stronger determined by the value of the worker's expected outside options. This implication is important for the purpose of our study, as it allows us to apply the following empirical proof by contradiction:

Let us assume that social norms on gender equality influence the unobserved productivity of women and men in different ways—i.e., women in more socially conservative areas might, for example, exert less efforts in their jobs even if working in the same firms and jobs as their male counterparts. Under this assumption, the model implies that we should find a significant relationship between our measure for social norms on the gender pay gap in the performance pay component and possibly in the workers' time-based pay component. Whether productivity differences influence the time-based pay component depends on the bargaining power of the employer and the extend to which productivity differences mitigate the outside option of women and men.

However, finding an effect of social norms on the gender pay gap under the time-based component but not under the performance pay component contradicts the assumption of gender-specific productivity differences according to the model. If the relationship between social norms for gender equality and the within-firm gender pay gap is not related to gender-specific productivity differences then the result would indicate a relationship

between social norms and the discriminatory pay-setting of firms.

IV Estimation strategy

In this section we lay out our empirical strategy. Specifically, we estimate regression equations of the following form:

$$\ln w_{i,e(j,r)}^c = \beta_0 + \beta_1 Female_i + \beta_2 Female_i \cdot A_r + \bar{\theta}_j + \bar{\eta}_r + \epsilon_{ie(j,r)} \quad (6)$$

$\ln w_{i,e(j,r)}^c$ is the logarithm of the worker i 's monthly pay. c indicates the type of pay and can be either the total pay (*tot*) or, for the subsample of workers on performance pay, the time-based component (*tb*) or the performance pay component (*pp*). $e(j,r)$ represents the branch of firm j in region r . $Female_i$ is a dummy variable that is 1 if the individual is female and 0 otherwise. A_r is our proxy for gender-specific social norms measured as the regional fraction of voters that approved the Swiss amendment relative to gender equality rights. In order to capture the within firm variation we incorporate the firm specific fixed effect $\bar{\theta}_j$. As there might be unobserved factors on the cantonal level which are not directly related to the cantonal voting behavior but might influence the pay of workers, we incorporate the canton specific fixed effect $\bar{\eta}_r$. Note that A_r varies only on the cantonal level. Thus the incorporation of the canton-specific fixed effect $\bar{\eta}_r$ does not allow us to identify the direct effect of the voting behavior A_r on the worker's pay level.

The level of our analysis is firms with branches in different regions. Therefore, our observations are grouped in non-nested clusters of firms and regions. A failure to account for this clustering might lead to massively underestimated standard errors and consequently to over-rejection of standard hypothesis tests. Therefore, we follow Cameron and Miller (2010) and estimate standard errors that account for the non-nested clustering on the firm and regional level. To ensure that the covariance matrix has full rank, we partial out the

control variables.

We estimate equation (6) for different subpopulations and with different sets of control variables. The coefficient estimate of β_2 is the result of main interest, as this coefficient displays the relationship between the firms' pay-setting behavior and the regional voter approval rate. More precisely, the coefficient estimate indicates by how much the gender pay gap changes between branches (of the same firm) that are located in regions with different social attitudes towards gender equality. We can interpret β_2 in this way because we incorporate a firm-specific fixed effect to the equation and identify β_2 only through the within-firm variance.

The model outlined in section III indicates three potential outcomes for β_2 for the regressions on the time-based and the performance pay component. If no structural relationship exists between social norms for gender equality and the pay-setting behavior of firms, we should find: $\beta_2^{pp} = 0$ and $\beta_2^{tb} = 0$. If unobserved regional gender-specific productivity differences constitute the relationship between social norms for gender equality and the pay-setting behavior of firms, we should find: $\beta_2^{pp} > 0$ and $\beta_2^{tb} > 0$. If social norms for gender equality mitigate the firms' discriminatory pay-setting behavior, we should find $\beta_2^{pp} = 0$ and $\beta_2^{tb} > 0$.

We first look at the entire sample of workers and then separately investigate the performance pay and time-based pay component for a subsample of workers on performance pay.

V Data

This section describes our two data sets in greater detail. As this article investigates the relationship between social norms and the pay-setting behavior of firms, our data fulfills three important requirements for identifying this effect. First, we are able to identify variation in regional social norms. Second, we are able to identify branches of single firms in

different regional labor markets in which individuals have different average gender-specific preferences. Third, for a subsample of workers on performance pay, we are able to identify the performance and time-based pay components to investigate whether the relationship between social norms for gender equality and the gender pay gap is characterized by unobserved productivity differences. Subsection A describes the voting data, and subsection B presents our data on the firms.

V.A. The Voting Data

To identify gender-specific preferences, we measure social norms for gender equality by voter approval rates across different regions, i.e., cantons⁴, in Switzerland. More specifically, we use information on voting outcomes on two amendments of the Swiss constitution with regard to gender equality. First, to proxy regional differences in social norms, we follow Lalive and Stutzer (2010) and use voting data on an amendment to the Swiss constitution on equal rights for women and men from 1981. However, this ballot took place more than 10 years before the observation period of our firm data. Although we could expect that social norms change slowly over time, we cannot be sure that social norms do not change over the course of more than 20 years. Specifically the 1980's have been a period of substantial progress towards more gender equality in the labor market and society in general. Such changes would be problematic for the interpretation of our results if the relative regional structure of social norms would have changed substantially. For example, regional specific immigration from other countries might alter social attitudes towards gender equality for specific regions but not for other regions. Therefore, we alternatively use information on regional voting behavior on the 2000 amendment to the Swiss constitution on a fair representation of women in the federal authorities. In the following we provide more detailed information on the amendment to the Swiss constitution and present

⁴Switzerland has 26 cantons, which are independent regions much larger than a county but much smaller than a state.

some descriptive statistics for both ballots.

In 1981 Swiss voters had to decide whether to amend the Swiss constitution to reflect not only the equality of human beings in general but the equality of women and men in particular. More specifically, the amendment to the Swiss constitution contains the following expressions:

- “Men and women have equal rights.”
- “Men and women have equal rights and duties in the family.”
- “Men and women are entitled to equal pay for equal work.”
- “Men and women are entitled to equal treatment and equal opportunities in education, schooling and vocational education, in employment and occupation.”

We argue that the regional voter approval rates provide a measure for identifying gender equality norms. Although we observe regional variation in social norms, the Swiss constitution applies to all regions. In other words, cantons whose voters rejected the amendment nonetheless have the legal obligation to abide by it. Therefore, the amendment has no legal consequences that differ across regions and therefore can be considered as an appropriate measure for preferences.

The data on the voting behavior we use comes from the Swiss Federal Statistical Office and represents the voter approval rates of the equal rights amendment across the 26 Swiss cantons on June 14, 1981.⁵ Overall, 60.3% of the voters favored the constitutional amendment, and 39.7% rejected it. Table A.1 provides the voting results separately for each canton.

—Table A.1 about here—

⁵The information is available from the Swiss Federal Statistical Office under <http://www.bfs.admin.ch/bfs/portal/de/index/themen/17/03/blank/data/05/01.html>.

The variation across cantons is substantial. While in Appenzell Inner Rhoden only about 30% of the voting population approved the amendment on equal rights, in Geneva more than 80% of the voting population approved it. In urban areas such as Zurich, the economic capital of Switzerland, only slightly more than 60% approved the amendment.

As both women and men participated in the voting, the approval rates should represent the opinion of both women and men within each region. Although actual voter approval rates for women and men are not available, given the anonymity of the ballot box, table A.2 shows the results of a post-vote survey on the voting behavior of women and men.⁶ The survey is provided by the Swiss Foundation for Research and Social Sciences and stems from a project called VoxIt, which has conducted post-voting surveys during the two or three weeks following all federal votes since 1977. The scope of the project is to infer information about Swiss voter behavior and political and social affinities. Although the survey data for the question on gender equality is not representative and is available only for some cantons, the results show a very similar pattern to the actual votes presented in table A.1.

—Table A.2 about here—

For example, in the real vote on the amendment, the cantonal approval rate was highest in Geneva at 85.2% and the result in the VoxIT data also shows Geneva with the highest approval rate, at 88.6%. St. Gallen and Aargau show low approval rates of 46.3% and 52.1%, respectively, in the real amendment and relatively low approval rates, at 63.4% and 68.4%, respectively in the VoxIT survey.

However, the important outcome of the post-vote survey is that the women's voting behavior quite strongly matches that of the men. Women have the lowest approval rates in St. Gallen and Aargau, whereas they have highest approval rates in Geneva and Zurich.

⁶For more information on the post-vote survey see http://forsdata.unil.ch/projects/Voxit/docu_x1_html/ListeVoxDispoD.htm?lang=e&menu=4.

Therefore, the post-vote survey provides some additional indication that the voting behavior proxies a social norm that manifests in both women's and men's preferences in a particular region.

As a second measure for social norms we use information on regional voting behavior on the 2000 amendment to the Swiss constitution on a fair representation of women in federal authorities. The main request of the amendment was that women should be fairly represented in all federal authorities (i.e., in the parliament, the federal council and the federal court) and in the administration (in particular in the federal administration, in state-owned and operated enterprises and in universities). Such as the information for the ballot on gender equality in the labor market, the data on the voting behavior on the fair representation amendment comes from the Swiss Federal Statistical Office⁷. Although the two amendments differ in their content, both cover an issue that is related to social norms on gender equality. Specifically, it is plausible to assume that the people's general feeling about gender equality affects both amendments in similar ways. Even if the absolute voting outcomes might not be comparable across the two amendments, the information nevertheless helps to clearly identify whether relative differences in social norms on gender equality determine differences in the gender pay gap across regions.

Table A.3 presents descriptive statistics on the voting outcome. In contrast to the amendment on gender equality, Swiss voters rejected the amendment on a fair representation of women in federal authorities. Overall 82.0% of Swiss voters rejected the amendment. Nevertheless, the patterns across regions are very similar to the patterns for the 1981 amendment. Therefore, the results indicate that the relative structure of social norms has not changed across cantons over time.

—Table A.3 about here—

Table A.3 uncovers that the relative pattern of the 2000 amendment is astonishingly

⁷The information is available from the Swiss Federal Statistical Office under <http://www.bfs.admin.ch/bfs/portal/de/index/themen/17/03/blank/data/07/01.html>.

similar to the pattern of the 1981 amendment in table A.1. For example, Geneva has the highest approval rate for both amendments whereas Appenzell IR has the lowest approval rates for both amendments. To clarify this relationship figure 2 plots the voting results for both amendments against each other. The graph shows a strong positive relationship between both amendments. Moreover, the correlation between both variables amounts to 87.11%. Thus the results strongly suggest that the relative structure of social norms did not change substantially over the course of more than 20 years.

V.B. The Firm Data

Our firm data stems from the Swiss Earnings Structure Survey (ESS), a survey covering a large number of firms. The ESS is based on two-level sampling (i.e., both firms and workers) and selects the firms from the Swiss business and enterprise register. The data is representative of all economic sectors except agriculture. The survey does not cover firms with fewer than 3 employees and provides no information on trainees, apprentices or workers who are only paid on commissions. Firms that are smaller than 20 employees are required to report all employees. Firms between 20 and 50 employees are allowed to report only every second employee, and firms with more than 50 employees are allowed to report every third employee. However, the firms are required to select their reported workers randomly. The ESS, which is based on two-level sampling (i.e., both firms and workers) procedure, selects the firms from the Swiss business and enterprise register. The ESS was conducted in biennially repeated cross-sections since 1994, and participation for firms is compulsory.

To identify multiple branches of firms across cantons, we need information on workers' administrative cantonal districts. As the EES provides such information only for 1994 through 1998, we restrict our sample to that period. Unfortunately, the data only allows to identify different branches if they are located in different cantonal regions. Multiple branches that are located within one region appear in the data source as a single branch.

This restriction, however, is not decisive for the main focus of our analysis, i.e., to analyze the relationship between social norms and firms' pay-setting behavior.

At the firm level, we restrict our sample to companies in the private sector with branches in more than one canton. To ensure that we can measure a gender pay gap within each branch, we require that every branch in our sample contains information about at least two employees and at least one woman and one man. Additionally, we exclude all agricultural firms because the observations in our data are not representative for this sector. Moreover, some firms report different industry categorizations for branches in different regions. We drop those firms from the sample. Given these restrictions we have to drop the small canton Appenzell Inner Rhoden from our sample, as none of the branches there matches our restrictions.

At the employee level, we restrict the sample to full-time workers (i.e., workers with more than 30 working hours per week) that were older than 16 when they entered the firm and younger than 65 at the time of the survey. We only incorporate full-time workers in our analysis because it is likely that part-time workers are very different from full-time workers in terms of their unobserved productivity. In particular, part-time working women are likely to follow very different career path than full-time working men. We are aware that this restriction is very restrictive and specifically excludes more women from our sample than men. However, our results do not change if we use the entire sample of workers. In fact the magnitude of the coefficient estimates becomes even bigger. Nevertheless, as we do not want to capture a part-time effect in our results, we decided to present only the results for the restricted sample of full-time workers in this paper. The remaining results are available upon request.

Table A.4 shows an overview of the observations of the restricted sample.

—Table A.4 about here—

A focus on employees without missing information for the included variables leaves us with around 332,087 employees, of whom 109,058 are women and 223,029 are men. In

total we observe 1277 firms with 4457 branches. Most firms in our sample have about four branches in different cantons whereby the maximum is 25—i.e., some firms have branches in every canton that we include into our sample.

For our investigation we use the following variables: Workers' pay is measured as standardized gross monthly wages. This pay measure includes an employee's contribution to social insurance, payment in kind, regularly paid-out participation in sales and bonuses, and compensation for shift- and night-work. In addition, thirteen months of payments or yearly special payments are included pro rata. Although inflation in Switzerland is not high, we adjust wages according to the National Consumer Price Index. We obtain the workers' education in categories and convert them in years of education according to Wirz (2008). We have a measure for the workers' years of tenure and their weekly working hours. We know whether workers are covered by a union contract and whether workers are married. We can observe the workers' occupation in twenty-four categories and create five dummies for the workers' professional status.

Descriptive statistics appear in table A.5 for all workers, as well as, separately, for women and for men. The table shows that about 30% of our sample is female. The average weekly working hours are around 40. The table shows that men earn about 0.30 log points more than females. Men have also slightly more education and their average tenure is about 3 years higher than that of females. While there is no big difference in the weekly working hours of men and women, men are substantially more often married and are more likely to hold a management position. This difference is most striking in top and upper management.

—Table A.5 about here—

To analyze whether unobserved productivity differences affect the relationship between voter approval rates and within-firm gender pay gaps, we exploit a particularity of our data: We restrict our sample to a subsample of workers for whom we are able to observe a fixed time-based pay component that is only based on the contractual working hours

and a performance pay component that includes payment for premiums, bonus payments, gratification and profit sharing. Given that for workers on piece rates, we are not able to observe the exact amount of pay that is related to workers' piece rates, we remove these workers from our sample of performance pay workers. In total our sample of performance pay workers amounts to 88,742 individual workers.

We show the descriptive statistics of the subsample of performance pay workers in table A.6

—Table A.6 about here—

30% of the restricted sample of performance pay workers are female. Thus the distribution of women and men appears similar to that in the entire sample of workers. On average, the time-based component of pay for performance pay workers is about 0.10 log points higher than the gross monthly wage for the entire sample of workers. This result holds for both women and men. The raw gender pay gap is about 0.30 log points for the performance pay and the time-based pay component. Therefore, the gender pay gap of the restricted sample is very similar to the gender pay gap of the entire sample.

VI Results

This section presents our results in detail. We undertake our investigation in three subsections. The first subsection provides descriptive results for the relationship between voter approval rates and key labor market outcomes. The aim of the first subsection is to understand how social norms are related to gender specific pay but also to the job and educational choices of women and men. The second subsection investigates the relationship between regional approval rates and the pay-setting behavior of firms for the entire sample of multi-branch firms. The third subsection investigates the subsample of workers for which we are able to observe the time-based and the performance pay component. The

aim of the second subsection is to analyze to what extent unobserved regional productivity differences influence the regional variation of within-firm gender pay gaps.

VI.A. Social norms and labor market outcomes

In the following figures 1 to 4 and table I we present results for the relationship between voter approval rates and specific labor market characteristics on the cantonal level.⁸ Figure 1 and the first column of table I show the relationship between the regional firm-internal gender pay gap—measured as the pay of female workers minus the pay of male workers—and the average regional approval rates in Switzerland.

— Figure 1 about here —

The figure is suggestive for a tendency that the average gender pay gap is smaller in branches located in regions where more voters approved the equality rights amendment than in regions where fewer voters approved the equality rights amendment. More specifically, the gender pay gap is on average about 0.10 log points smaller in branches located in regions where about 80% approved the equal rights amendment than in branches located in regions where only about 40% approved the equal rights amendment. Thus the figure indicates a difference of about 30% in the gender pay gap between the two extremes. In addition to figure 1 the first column of table I shows that approval rates can explain about 50% of the regional variation in gender pay gaps.

— Table I about here —

⁸All results stem from the following two-step procedure: First, we predicted the relevant cantonal statistics such as, for example, gender gaps in pay or education for each canton using all observations. Second, we regress these predicted statistics on the regional shares of voter approval rates by collapsing the data to the 25 observation on the cantonal level. To take into account that the gender gaps are estimated with varying precision, we weight each of the 25 observations by the inverse of the coefficient variance of the first-stage regression. As our interest lies in investigating the differences in labor market characteristics within firms we account for firm fixed effects in the first stage.

Though our sample is restricted on full-time workers of rather big firms, social norms might be an important determinant for a variety of productivity relevant characteristics for workers of different gender. For example, women in socially more conservative regions might work in different occupations, might be less likely to work in management positions or are less educated than women in socially less conservative regions. These effects might play an important role even for full-time working women. Therefore, in the next figures we investigate the relationship between voter approval rates and important productivity relevant characteristics.

Figure 2 shows the relationship between voter approval rates and the firm-internal gender gap in years of education.

— Figure 2 about here —

Figure 2 shows that for women the number of average years of education is 1 to 1.5 years less than for men. However, in contrast to figure 1, figure 2 does not show a strong structural relationship between voter approval rates and the gender gap in years of education. In other words, the figure does not support that the gender gap in years of education is lower for women working in branches located in areas where more voters approved the amendment than in regions where less voters approved the amendment. Moreover, the second column of table I shows that voter approval rates only explain about 3% of the variation in the gender gap in years of education.

Women following a traditional role model with a strong focus on their families might not be able to combine the heavy workload of managerial positions with their household duties and miss out on critical stages in their career development. Moreover, to avoid future labor shortages in job positions that are crucial for firm success, firms in more socially conservative regions might be less likely to assign women to high ranked positions. In figure 3 we investigate the relationship between voter approval rates and the probability to hold a management positions. Figure 3 demonstrates that—even after accounting for

the unobserved heterogeneity of firms—women are about 20% less likely to hold a management position than men. Nevertheless, such as in figure 2 we do not find a structural relationship between voter approval rates and the gender gap of holding a management position.

— Figure 3 about here —

If men and women in different regions face different social expectations, they might not only differ in their preferences while already working but might differ in their preferences for occupational choices. Previous empirical evidence shows that women and men still choose different types of occupations and follow substantially different career paths. Women are more likely to choose occupations that allow them to combine work and family life or have preferences for stereotypically female jobs. Brown and Cocran (1997) show, for example, that boys take more math and science classes and that girls take more language classes. Thus differences in social norms might induce pre-labor market differences in occupational preferences and lead to a substantial occupational segregation even within firms. In other words social norms are likely to influence the degree of occupational segregation. To further investigate this issue, we calculate the Duncan index—a common measure to infer the degree of occupational segregation—according to equation (1).

$$D_{f-m}^K = \frac{\sum_{k=1}^K |X_f^k - X_m^k|}{2} \quad (7)$$

X_f^k is the share of females working in occupation k , and X_m^k is the share of males working in occupation k . The value of the index indicates the percentage of female workers who must change occupations to achieve an occupational distribution identical to male workers. Figure 4 shows the relationship between voter approval rates and the Duncan index conditioned on firm fixed effects.

— Figure 4 about here —

The figure indicates that roughly 40% of females would have to change their occupation to achieve an occupational distribution similar to men. The Duncan index shows a great variability across regions and ranges from approximately 0.25 to 0.5. Nevertheless, such as for years of education and management positions we cannot find a structural relationship between voter approval rates and the Duncan index across regions. Moreover, column four of table I indicates that voter approval rates account for less than 1% of the regional variation of the Duncan index.

These first results show a strong structural relationship between voter approval rates and the gender pay gaps across regions. However, we cannot find such a strong structural relationship between voter approval rates and other key labor market variables. Therefore, these results support the hypothesis that firms pay setting behavior differs under the influence of different social norms. In the next section we aim at estimating the precise within-firm effect of voter approval rates on gender pay gaps to learn about the relationship between social norms and the firms' wage setting behavior.

VI.B. Estimation results

In this section we estimate various specifications of equation (6) for the entire sample of observed workers. Table II presents the estimation results. The table shows six different specifications including different sets of control variables.

— Table II about here —

The first column of Table II shows the results of specification I, which does not include any control variables. The first row of column I shows a within firm gender pay gap that amounts to about 44% for a branch located in a hypothetical region where nobody approved the equality rights amendment. The second row displays the effect of main interest. The point estimate of the interaction term between voter approval rates and the indicator for females is 0.223. This value indicates that every 10% difference in voter

approval rate is associated with a 2.2 percentage points decrease in the within-firm gender pay gap. For example, the two cities of Lucerne and Basel Stadt are of similar size and have a similar urban structure. The within-firm average gender pay gap is about 32% in a branch in Lucerne where about 50% approved the amendment. Yet the pay gap is only 28% in Basel Stadt where about 72% approved the amendment. Thus in our example the gender pay gap decreases by 4 percentage points and is therefore about 12% smaller in Basel Stadt than in Lucerne.⁹

Such as mentioned in the data section, the amendment for gender specific equality rights took place in 1981 and therefore more then 10 years before our observation period. Therefore, in the second specification we replace the voting data of the 1981 amendment with voting data of the 2000 amendment for a fair representation of women in federal authorities. The second column of table II shows the results. The coefficient estimate of the interaction term between the approval rates of the 2000 amendment and the gender dummy shows a highly significant positive coefficient estimate. Specifically, a 10% increase in voter approval rates is associated with a 3.9% decrease in the firm internal gender pay gap. Conclusively, the results of the 2000 amendment confirm our results of the 1981 amendment.

In the remaining three specifications we successively add further control variables to the regression. We are aware that social norms are likely to affect most of these control variables directly and, therefore, we cannot assume that these further control variables are exogenous. Therefore, including these further variables serves mainly as a robustness check to show that our results do not change for different specifications.

In specification III of table II we investigate to what extent the incorporation of occupation dummies influences the regional variation in the gender pay gap. The inclusion of occupational dummies reduces the coefficient estimates of both variables. However, the

⁹Note that the result in the first column of table II is very similar to the result of figure 1 and table I. Nevertheless, the coefficient estimates are not directly comparable. The purpose of the investigation in 1 and table I was to access the overall effect and explanatory power of the relationship between voter approval rates and gender specific pay whereas the results in table II directly estimate the within-firm effects.

effects are very modest. Therefore, occupational segregation appears not to be the major mechanism by which social norms influence the pay-setting behavior of firms.

In specification IV of table II we examine how the inclusion of the worker's job position mitigates the relationship between voter approval rates and gender pay differentials. The job position is measured in five categories ranging from no management position to high and upper management position. After the inclusion of the dummies for the worker's job position the magnitude of the average isolated gender pay gap decreases to about 36%. In contrast, the coefficient estimate of the interaction term between approval rates and the gender dummy increases slightly and now amounts to 0.257.

In specification V, we investigate to what extent observable individual worker characteristics mitigate the relationship between regional approval rates and firm internal pay gaps. Specifically, we add variables for tenure and its squared, worker's entry-age and its squared term, union and marital status, and years of education to specification V. Moreover, in order to account for the gender specific effects of the workers' entry age on wages we interact the entry-age variable with the gender dummy.

In the first row of column V we find substantial effects of observable worker characteristics on the isolated gender pay gap. Specifically, the gap drops by about 0.12 log points from 0.360 log points to about 0.235 log points. This result indicates that observable worker characteristics mitigate a substantial amount of the average gender pay gap. In comparison to these effects, the decrease in the coefficient estimate of the interaction term between voter approval rates and the female dummy is rather modest. The coefficient estimate drops from about 0.257 log points to about 0.181 log points. Thus even if observable worker characteristics mitigate a substantial part of the average gender pay gap, observable worker characteristics do not substantially mitigate the relationship between voter approval rates and the regional variation in gender pay differentials. Referring to our previous example, the conditional gender pay gap under this specification is about 15% in Lucerne and about 11% in Basel Stadt. In other words, the conditional gender pay gap is

about 33% higher in Lucerne than in Basel Stadt.

The evidence makes clear that the inclusion of occupations, job assignments, or differences in observable productivity-relevant worker characteristics do not alter the relationship between voter approval rates and within-firm gender pay gaps in a substantial way. Nevertheless, although our variables of job and worker characteristics are very detailed, unobserved productivity differences can still play a substantial role. Women working in regions where social norms support a more traditional role model might be less likely to invest in on-the-job training or exert less effort in their jobs than women in regions where the public opinion challenges the traditional role model. If these unobserved productivity differences are the only influence that explain the relationship between social norms on gender equality and the within-firm gender pay gap, the results would contradict our hypothesis that social norms influence the firms' discriminatory pay-setting behavior. The next section investigates this problem in great detail.

VI.C. Time-based vs. performance pay

The best way to investigate whether regional productivity differences can explain the relationship between voter approval rates and within-firm gender pay gaps, is either a natural experiment or another exogenous source that shifts the distribution of voter approval rates A_r but not the distribution of the unobserved error component $\epsilon_{ie(j,r)}$. However, social norms and cultural settings tend to change very slowly, particularly moreso than economic conditions. Therefore, finding a natural experiment is difficult. As no such exogenous variation is available for the purpose of our study, we exploit another speciality of our data source to investigate whether our results are a pure consequence of gender-specific regional productivity differences.

Our data allows us to identify a sub-population of our sample for which we can observe not only the time-based pay component but also the exact amount of the performance pay component. We can thus plausibly assume that performance pay is stronger correlated to

the unobserved (for the researcher) productivity of workers, than time-based pay. As an appropriate performance pay scheme is designed for obtaining more effort from the workers, the workers' performance pay component should be highly correlated to the workers' productivity (e.g., Lazear, 2000b). Firms and single employers usually do not bargain about performance pay, and, in contrast to time-based pay, the information about the payment is public to the workforce. Such factors reduce the employers' potential to discriminate workers in the performance pay component. In addition, these factors minimize the effect of social influences such as gender differences in bargaining behavior. Several empirical papers support our assumption by showing that performance pay is more closely tied to unobserved productivity characteristics than time-based pay (e.g., Lemieux et al., 2009).

We are aware that performance pay is not an entirely objective performance measure, because some forms of performance pay depend on subjective evaluations of managers. Nevertheless, for the purpose of our study, the assumption that performance pay is at least as correlated with the unobserved productivity of men and women as time-based pay is sufficient. Given this assumption, we should find a similar pattern for the performance pay component and the time-based component if the results of the former subsection were mainly an outcome of gender-specific unobserved regional productivity differences. In contrast, failing to find similar correlations between the voter approval rates for the gender pay gap in performance pay and time-based pay would contradict the assumption that unobserved productivity differences are the major explanation of the within-firm variation in the gender pay gap.

In applying this simple idea to the data, we restrict our data to a sub-sample of performance pay workers and, separately, present the estimations for their performance pay and their time-based component. We are aware that our sub-sample of performance pay workers is a highly selective sample that does not represent the entire workforce. However, the aim of this exercise is to compare the effects of the voter approval rates on two different payment forms of the same workers to understand how unobserved productivity

differences affect the regional pay-setting behavior of firms.

We present the results in tables III and IV. Table III shows the results for the time-based component of pay. Table IV shows the results for the performance pay component of those same workers.

— Table III about here —

— Table IV about here —

In specification I of table III, we show the results without further control variables. The results show an isolated gender pay gap for the time-based component of pay of about 0.394 log points. This value is very similar to the estimates from the entire sample in table II.

The result of main interest—the coefficient estimate of the interaction term between the female dummy and the voter approval rate—shows a positive significant estimate for the time-based pay component. The effect is with 0.174 log points, slightly smaller than the effect for the entire sample in table II. One possible explanation is that women working under performance pay are more competitive or more focused on their career, so that the gender pay gap is somewhat smaller for performance pay workers—even in the time-based pay component.

The first specification of table IV shows the same results for the performance pay component of those same workers. In contrast to the results for the time-based component, we do not find a significant effect of the interaction term on the performance pay component. Specifically, the effect for the performance pay component is about 0.09 log points smaller than for the time-based pay component and is accompanied by a huge standard error. Therefore, the results contradict the assumption that unobserved productivity differences are the explanation for the within-firm variation in gender pay gaps.

In specification II of table III and IV we replace the voting data of the 1981 amendment by the voting data of the 2000 amendment. The results of specification II are qualitatively similar to those in specification I and thus support our argumentation.

For specification III, where we incorporate all controls for observable job and worker characteristics, our findings show a substantial reduction of the isolated gender pay gap for both the workers' performance pay and the workers' time-based pay component. In contrast, the coefficient estimate of the interaction term between the female dummy and the regional approval rate decreases only slightly for the time-based pay component, whereas the same interaction term remains insignificant for the performance pay component. Although the coefficient estimate for the performance pay component decreases more than for the time-based pay component, the standard error of the estimated coefficient remains quite stable.

In specification IV of table III we add a final robustness check by adding the performance pay variable plus the interaction with the dummy for females to the regression equation. Under the assumptions that productivity differences are not the main explanation for the relationship between voter approval rates and the within-firm gender pay gap and that performance pay is more closely related to the workers' productivity than time-based pay, the incorporation of the performance pay component should not affect the estimate for the interaction term between approval rates and the gender dummy. The results in specification IV show that the incorporation of performance pay reduces the isolated gender pay gap substantially but barely affects the coefficient estimate of the interaction term between voter approval rates and the gender dummy.

In summary, we cannot reject the hypothesis $\beta_3^{pp} = 0$ and $\beta_3^{tb} > 0$. Therefore, our results contradict the assumption that regional gender-specific productivity differences constitute the relationship between social norms and the variation of within-firm gender pay gaps. However, if unobserved productivity differences cannot explain this relationship, the results provide strong support for our argument that social norms for gender-equality mitigate the firms' discriminatory pay-setting behavior.

One concern with the results in table III and IV is that measurement error might be bigger for the information for the performance pay component than for the information of the

time-based pay component. Although the data for both forms of payment are collected by the same source (the statistical office of Switzerland), the information on the performance pay data might be less adequate than that on the time-based pay data. For example, firms might collect the data on the time-based pay more adequately than for performance pay. Given that a structural relationship between this type of measurement error in the dependent variable and the explanatory variable is not likely, this measurement error does not bias our coefficient estimates. Nevertheless, measurement error in the dependent variable could increase the standard errors of the coefficient estimates even if such a structural relationship does not exist. However, even without the presence of measurement error in the dependent variables we can expect to observe bigger standard errors under performance pay than under time-based pay, as performance pay is more closely related to unobserved productivity differences than time-based pay. Yet, if the results were an artifact stemming from differences in measurement error between the performance pay and time-based pay component, the results would not support our argumentation.

To deal with these concerns, we make two further investigations: First, we estimate our regressions with homoscedastic error variances. This approach leads to a potential underestimation of standard errors if the assumption of homoscedasticity is violated. Nevertheless, given that our line of argumentation rests upon the insignificance of a coefficient estimate, such an approach constitutes the more conservative approach for our specific objective.

Table V and VI presents the results of this approach. As the tables shows, the homoscedastic standard errors are substantially smaller than the clustered standard errors. In most cases, the standard errors are reduced by more than half. Nevertheless, these results are still in line with our argumentation. Specifically, even with these potentially underestimated standard errors, the interaction term between voter approval rates and the female dummy is not significantly different from zero for the regressions on performance pay.

— Table V about here —

— Table VI about here —

Second, if measurement error is accountable for a substantial part of the variation in our performance pay measure, we expect not to find significant correlations between our performance pay measure and other productivity relevant variables. Therefore, we separately estimate the rates of return to tenure and education for the time-based and the performance pay component. The results appear in table VII. We perform separate regressions for women and men, and the regressions contain all control variables and firm fixed-effects.

— Table VII about here —

Table VII shows that all coefficient estimates have the expected signs and are highly significant for the time-based and the performance pay component. The estimated coefficients are even higher for the performance pay component. Moreover, the specifications show very similar rates of return for women and men—both under the time-based and the performance pay component. Consequently, these results support the view that our findings are not an artifact stemming from measurement error.

Thus the results in this section contradict the notion that the relationship between social norms on gender equality and the within-firm gender pay gap are a consequence of regional gender-specific productivity differences. The results support the existence of a relationship between social norms on gender equality and the discriminatory pay-setting of firms.

VII Conclusion

This study analyzes the relationship between social norms on gender equality and firms' pay-setting behavior by combining information on regional variation in social norms on gender equality with a large data set of multi-branch firms and workers. The results show that the within-firm gender pay gap is bigger in regions with a higher acceptance for gender

inequality than in regions with lower acceptance. To infer whether unobserved productivity differences can explain the relationship between social norms and the firms' pay-setting behavior, we estimate the relationship between social norms and the performance pay component and time-based pay component of the same workers. As performance pay is more closely related to the workers' productivity than time-based pay, our approach aims at showing that the relationship between gender-specific social norms and the gender pay gap is not driven by regional gender-specific productivity differences. While we indeed find strong effects of social norms on the gender pay gap in time-based pay, we cannot find an effect of social norms on the performance pay component for those same workers. Therefore, our findings are consistent with our hypothesis that social norms on gender equality influence the preferences of individuals, in turn mitigating the firms' discriminatory pay-setting.

Our results indicate that firms set discriminatory pay even within a small country where they face rather similar legal regulations and institutional frameworks in every region. Yet our results also have high external validity for other countries: especially as our evidence raises the important question of whether multinational companies exploit country-specific labor markets where they rather face very different legal restrictions. Further research in this direction would provide important insights for policies of cross-national labor organizations and labor market regulations.

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VIII Tables and figures in the text

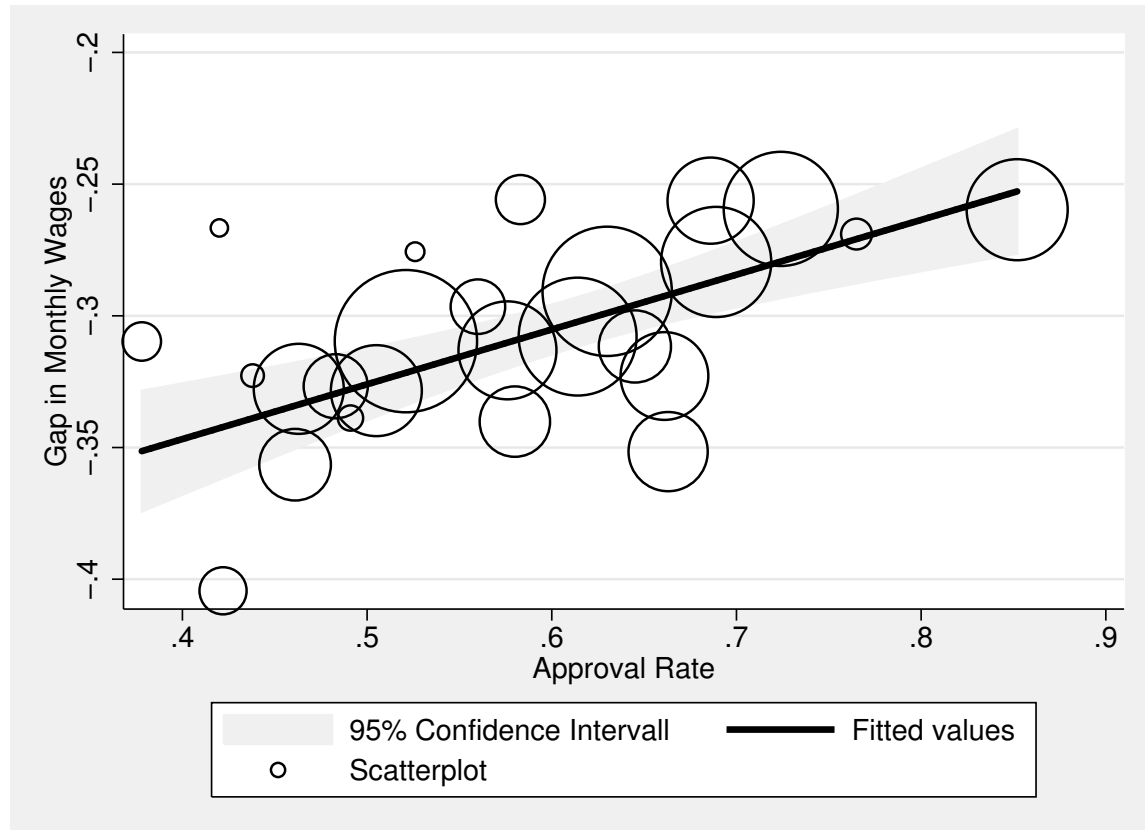


Figure 1:

MONTHLY WAGES AND APPROVAL RATES

Notes: Y-axis: Average gender gap in monthly wages. X-axis: regional approval rate.

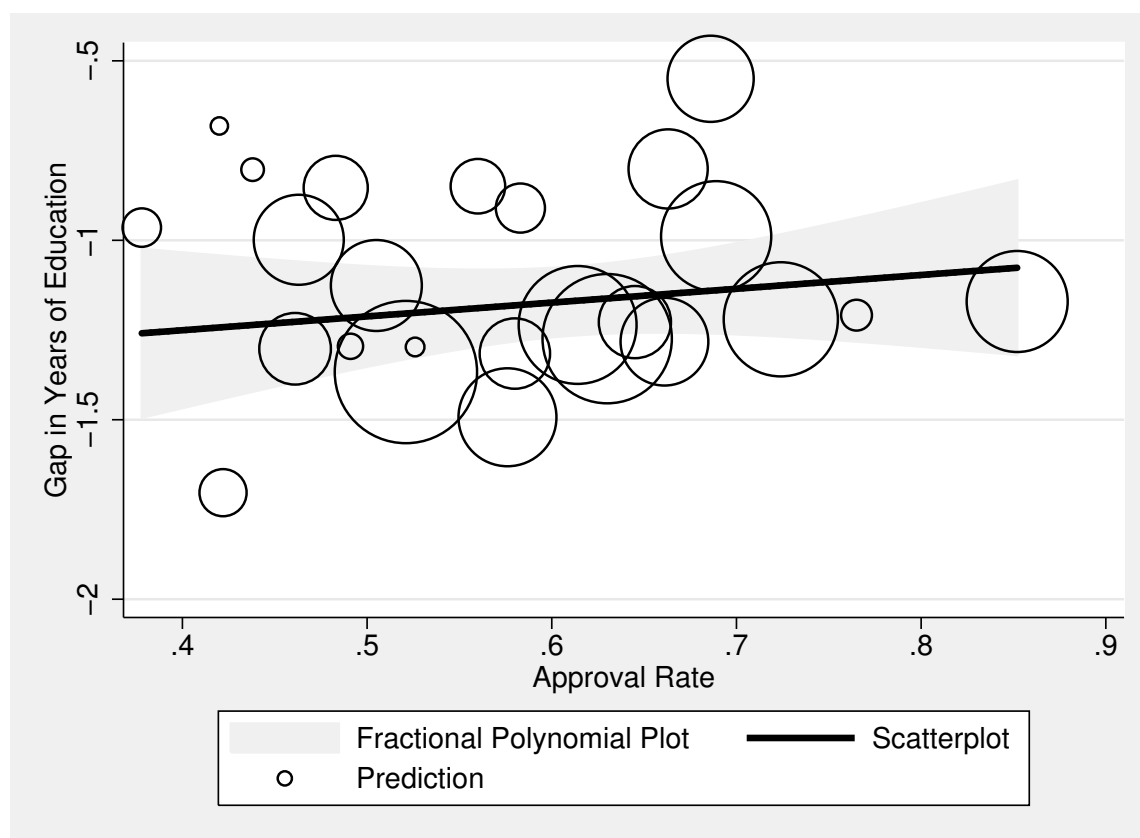


Figure 2:
YEARS OF EDUCATION AND APPROVAL RATES

Notes: Y-axis: Average gender gap in years of education. X-axis: regional approval rate. The 25 cantonal observations are weighted by the inverse of the coefficient variance of the first-stage regression on the individual level.

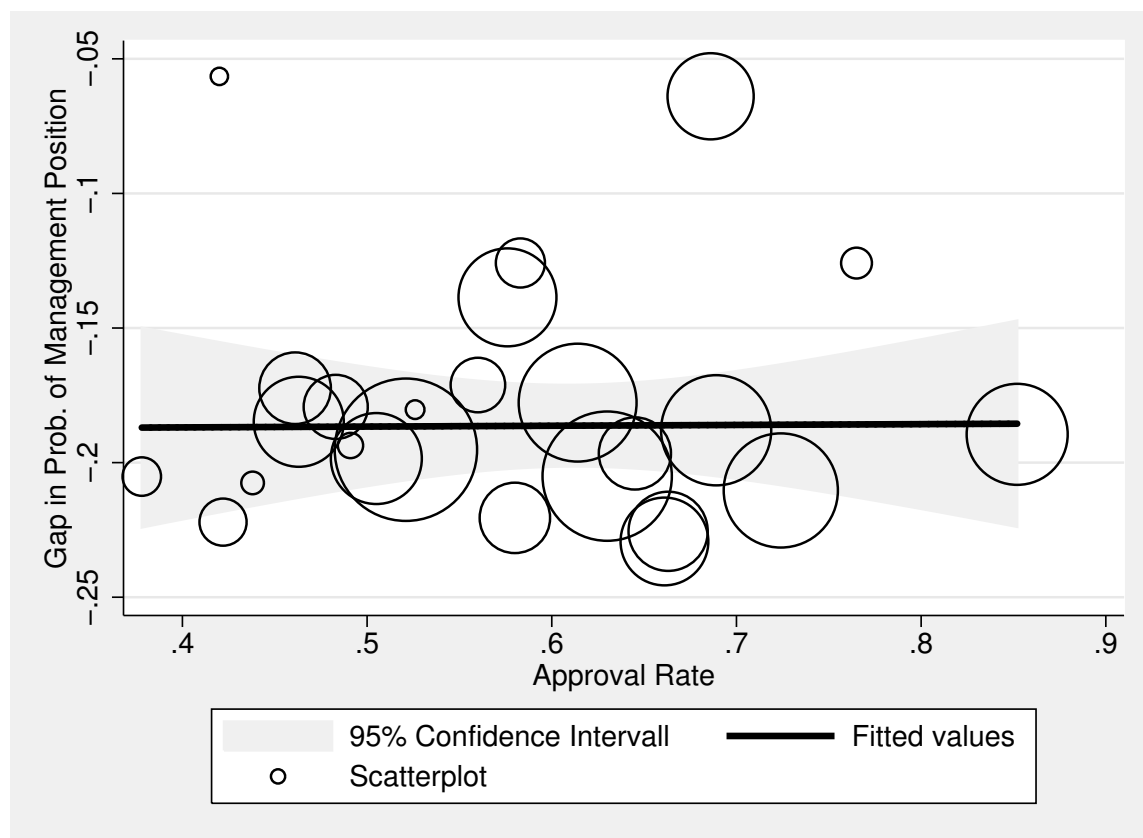


Figure 3:
MANAGEMENT POSITION AND APPROVAL RATES

Notes: Y-axis: Average gender gap in prob. of holding a management position. X-axis: regional approval rate. The 25 cantonal observations are weighted by the inverse of the coefficient variance of the first-stage regression on the individual level.

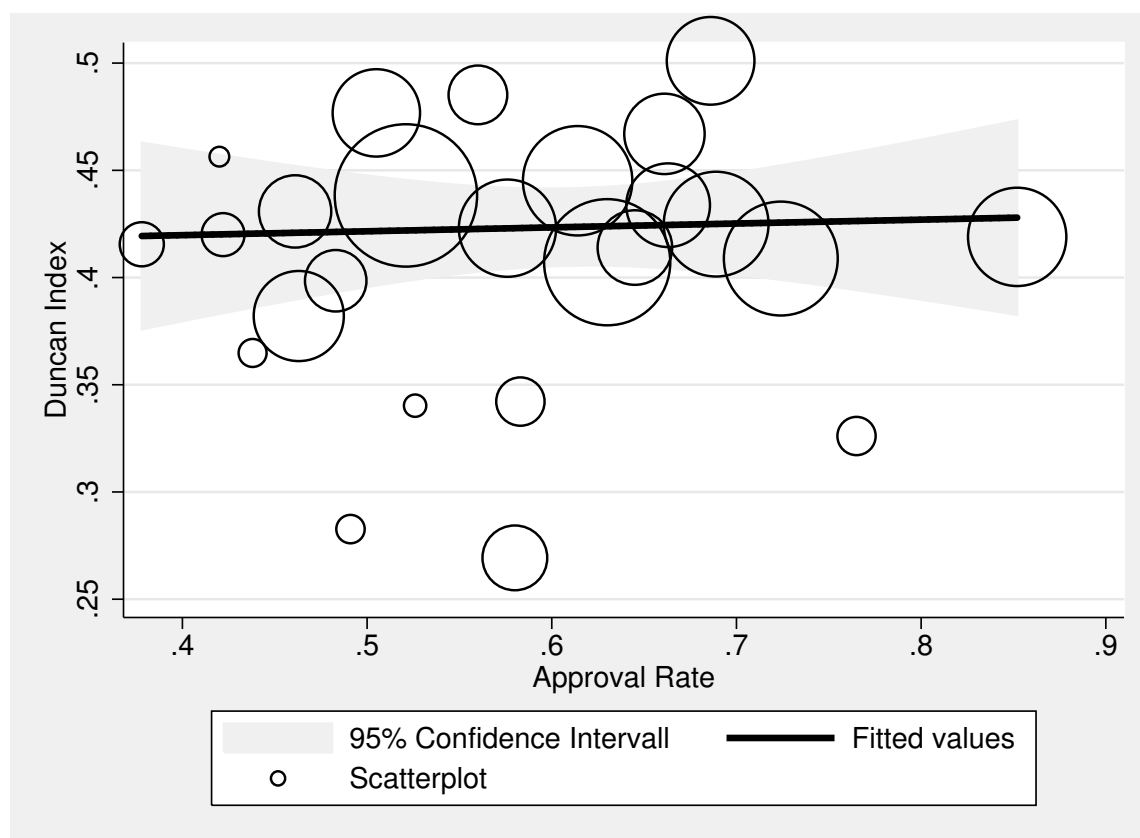


Figure 4:

DUNCAN INDEX AND APPROVAL RATES

Notes: Y-axis: Average Duncan index. X-axis: regional approval rate. The 25 cantonal observations are weighted by the inverse of the coefficient variance of the first-stage regression on the individual level.

Table I:
EXPLANATORY POWER OF APPROVAL RATES (SECOND STAGE RESULTS)

	Pay	Years of education	Management position	Duncan index
Approval Rates	0.208*** (0.043)	0.385 (0.447)	0.003 (0.070)	0.018 (0.083)
R-squared	0.499	0.031	0.000	0.002
N	25	25	25	25

Notes: The firm and individual data are drawn from the Swiss Earnings Structure Survey 1994-1998. The voting data stem from the Swiss Federal Statistical Office. The results stem from a two-stage procedure. The observations are weighted by the inverse of the variance of the first stage regression. * Significant at 10 % level; ** Significant at 5 % level; *** Significant at 1 % level.

Table II:
WAGE REGRESSION II (MONTHLY WAGES OF THE ENTIRE SAMPLE)

	I	II	III	IV	V
Female	-0.437*** (0.020)	-0.372*** (0.011)	-0.418*** (0.013)	-0.359*** (0.024)	-0.235*** (0.032)
Female*Approval Rate: Equal Rights (1981)	0.223*** (0.033)	-	0.208*** (0.017)	0.257*** (0.028)	0.181*** (0.031)
Female*Approval Rate: Representation (2000)	-	0.379*** (0.053)	-	-	-
N	332087	332087	332087	332087	332087
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes
Occupation	No	No	Yes	Yes	Yes
Job position	No	No	No	Yes	Yes
Prod. relevant characteristics	No	No	No	No	Yes
Observations	332087	332087	332087	332087	

Notes: The firm and individual data are drawn from the Swiss Earnings Structure Survey 1994-1998. The voting data stem from Swiss Federal Statistical Office. The dependent variable is monthly time-based wage for all workers. The control variables include: tenure, firm entry age, education union status, marital status, professional status and occupation. Non-nested standard errors are calculated at the region and firm level. * Significant at 10 % level; ** Significant at 5 % level; *** Significant at 1 % level.

Table III:
WAGE REGRESSION III: TIME-BASED PAY COMPONENT

	I Base	II Representation	III Controls: Labor Market	IV Controls: Performance Pay
Female	-0.394*** (0.029)	-0.342*** (0.021)	-0.223*** (0.042)	-0.178*** (0.049)
Female*Approval Rate: Equal Rights (1981)	0.174*** (0.047)	-	0.127** (0.058)	0.172*** (0.035)
Female*Approval Rate: Representation (2000)	-	0.290*** (0.098)	-	-
N	88742	88742	88742	88742

Notes: The firm and individual data are drawn from the Swiss Earnings Structure Survey 1994-1998. The voting data stem from Swiss Federal Statistical Office. The dependent variable is monthly time-based component for all workers. Labor market controls include: tenure , firm entry age, education union status, marital status, professional status and occupation. All specifications include firm and canton fixed effects. Non-nested standard errors are calculated at the region and firm level. * Significant at 10 % level; ** Significant at 5 % level; *** Significant at 1 % level.

Table IV:
WAGE REGRESSION III: PERFORMANCE PAY COMPONENT

	I Base	II Representation	III Controls: Labor Market
Female	-0.478*** (0.159)	-0.434*** (0.096)	-0.321* (0.173)
Female*Approval Rate: Equal Rights (1981)	0.088 (0.238)	-	0.026 (0.225)
Female*Approval Rate: Representation (2000)	-	0.061 (0.397)	-
N	88742	88742	88742

Notes: The firm and individual data are drawn from the Swiss Earnings Structure Survey 1994-1998. The voting data stem from Swiss Federal Statistical Office. The dependent variable is monthly performance pay components for all workers. Labor market controls include: tenure , firm entry age, education union status, marital status, professional status and occupation. All specifications include firm and canton fixed effects. Non-nested standard errors are calculated at the region and firm level. * Significant at 10 % level; ** Significant at 5 % level; *** Significant at 1 % level.

Table V:

WAGE REGRESSION IV: TIME-BASED PAY COMPONENT (HOMOSCEDATIC STANDARD ERRORS)

	I Base	II Representation	III Controls: Labor Market	IV Controls: Performance Pay
Female	-0.394*** (0.015)	-0.342*** (0.009)	-0.223*** (0.017)	-0.178*** (0.014)
Female*Approval Rate: Equal Rights (1981)	0.174*** (0.023)	-	0.127*** (0.014)	0.172*** (0.018)
Female*Approval Rate: Representation (2000)	-	0.290*** (0.043)	-	-
N	88742	88742	88742	88742

Notes: The firm and individual data are drawn from the Swiss Earnings Structure Survey 1994-1998. The voting data stem from Swiss Federal Statistical Office. The dependent variable is monthly time-based component for all workers. Labor market controls include: tenure , firm entry age, education union status, marital status, professional status and occupation. All specifications include firm and canton fixed effects. Non-nested standard errors are calculated at the region and firm level. * Significant at 10 % level; ** Significant at 5 % level; *** Significant at 1 % level.

Table VI:

WAGE REGRESSION IV: PERFORMANCE PAY COMPONENT (HOMOSCEDATIC STANDARD ERRORS)

	I Base	II Representation	III Controls: Labor Market
Female	-0.478*** (0.045)	-0.434*** (0.045)	-0.321*** (0.076)
Female*Approval Rate: Equal Rights (1981)	0.088 (0.071)	-	0.026 (0.060)
Female*Approval Rate: Representation (2000)	-	0.061 (0.134)	-
N	88742	88742	88742

Notes: The firm and individual data are drawn from the Swiss Earnings Structure Survey 1994-1998. The voting data stem from Swiss Federal Statistical Office. The dependent variable is monthly performance pay components for all workers. Labor market controls include: tenure , firm entry age, education union status, marital status, professional status and occupation. All specifications include firm and canton fixed effects. Non-nested standard errors are calculated at the region and firm level. * Significant at 10 % level; ** Significant at 5 % level; *** Significant at 1 % level.

Table VII:
TENURE AND EDUCATION

	Men		Women	
	Performance pay	Time-based pay	Performance pay	Time-based pay
Education	0.040*** (0.009)	0.029*** (0.003)	0.042*** (0.009)	0.028*** (0.003)
Tenure	0.038*** (0.007)	0.013*** (0.001)	0.044*** (0.007)	0.011*** (0.002)
Tenure sq	-0.001*** (0.000)	-0.000*** (0.000)	-0.001*** (0.000)	-0.000** (0.000)
N	62419	62419	26323	26323

Notes: The firm and individual data are drawn from the Swiss Earnings Structure Survey 1994-1998. The voting data stem from the Swiss Federal Statistical Office. The dependent variable is the monthly time-based pay component and the performance pay component. The control variables include: firm entry age, education, union status, marital status, professional status, occupation and firm fixed effects. Non-nested standard errors are calculated at the region and firm level. * Significant at 10 % level; ** Significant at 5 % level; *** Significant at 1 % level.

A Appendix

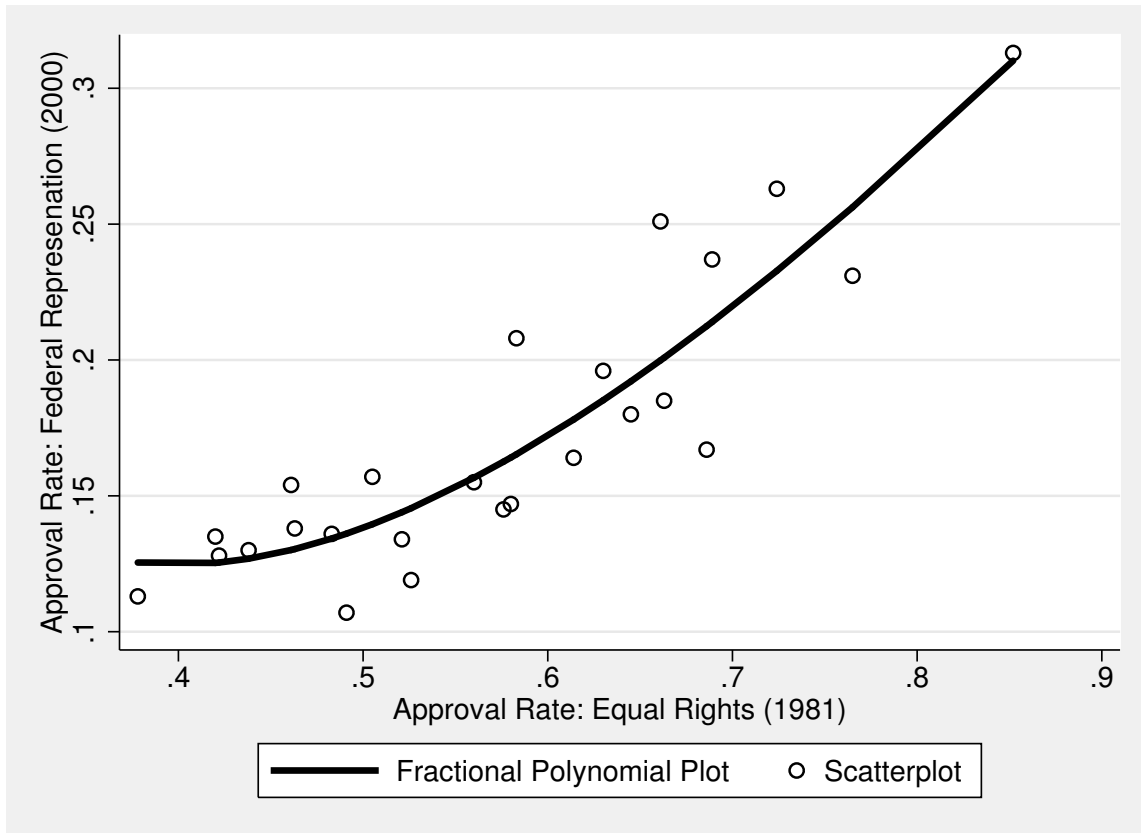


Figure 5:

RELATIONSHIP BETWEEN APPROVAL RATES

Notes: Y-axis: Federal representation . X-axis: Equal rights.

Table A.1:
REGIONAL VOTER APPROVAL RATES: EQUALITY RIGHTS

Region	Total vote	In favour	Approval rate
Appenzell IR	2529	805	31.8
Schwyz	20075	7594	37.8
Glarus	8014	3362	42.0
Appenzell AR	11244	4743	42.2
Uri	8265	3'616	43.8
Valais	33084	15237	46.1
St. Gallen	73620	34073	46.3
Thurgau	40270	19469	48.3
Nidwalden	7141	3508	49.1
Lucerne	67982	34313	50.5
Aargau	85950	44782	52.1
Obwalden	5362	2818	52.6
Graubünden	30054	16830	56.0
Solothurn	88576	51029	57.6
Zug	20554	11925	58.0
Schaffhausen	28591	16673	58.3
Bern	177168	108695	61.4
Zurich	266619	168099	63.0
Fribourg	28936	18674	64.5
Neuchâtel	30399	20095	66.1
Ticino	42915	28438	66.3
Basel-Landschaft	44530	30540	68.6
Vaud	78446	54073	68.9
Basel-Stadt	44687	32354	72.4
Jura	11040	8450	76.5
Geneva	67536	57507	85.2

Notes: The voting data stem from Swiss Federal Statistical Office.

Table A.2:
REGIONAL APPROVAL RATES BY GENDER

Region	All		Men		Women	
	Total vote	Approval	Total vote	Approval	Total vote	Approval
St. Gallen	101	63.4	48	56.3	53	69.8
Aargau	69	68.1	36	66.7	33	69.7
Bern	195	74.9	97	66.0	98	83.7
Basel-Landschaft	38	81.6	20	90.0	18	72.2
Zurich	204	82.8	109	79.8	95	86.3
Vaud	122	85.2	57	80.7	65	89.2
Basel-Stadt	54	87.0	27	77.8	27	96.3
Geneva	44	88.6	20	95.0	24	83.3

Notes: The voting data stem from the VoxIt.

Table A.3:
REGIONAL VOTER APPROVAL RATES: FEDERAL REPRESENTATION

Region	Total vote	In favour	Approval rate
Appenzell IR	4326	302	7.1
Schwyz	42644	4719	11.3
Glarus	9773	1305	13.5
Appenzell AR	17888	2273	12.8
Uri	13158	1670	13.0
Valais	62192	9405	15.5
St. Gallen	122918	16859	13.8
Thurgau	58927	7767	13.6
Nidwalden	11933	1251	10.7
Lucerne	108443	16694	15.7
Aargau	142115	18842	13.4
Obwalden	9725	1134	11.9
Graubünden	45797	6945	15.5
Solothurn	74518	10672	14.5
Zug	30181	4403	14.7
Schaffhausen	32036	6215	20.8
Bern	293435	47248	16.4
Zurich	348186	66411	19.6
Fribourg	63937	11298	18.0
Neuchâtel	37056	9088	25.1
Ticino	58129	10453	18.5
Basel-Landschaft	74452	12214	16.7
Vaud	127270	29548	23.7
Basel-Stadt	61435	15853	26.3
Jura	18464	4174	23.1
Geneva	96666	29571	31.3

Notes: The voting data stem from Swiss Federal Statistical Office.

Table A.4:
OBSERVATIONS

<i>Individual</i>	
Total	332087
Women	109058
Men	223029
<i>Firm</i>	
Firms	1277
Branches	4457
<i>Branches per firm</i>	
Median	4
Min	2
Max	25

Notes: The firm and individual data are drawn from the Swiss Earnings Structure Survey 1994-1998.

Table A.5:
SUMMARY STATISTICS: ENTIRE SAMPLE OF WORKERS

Variable	All	Female	Male
Log gross monthly wage	8.634 (0.38)	8.409 (0.313)	8.745 (0.361)
Female (Dummy)	0.328 (0.47)	1.000 (0.000)	0.000 (0.000)
Firm entry age	29.841 (8.502)	29.557 (8.917)	29.979 (8.285)
Education in years	12.351 (2.276)	11.515 (1.927)	12.759 (2.321)
Tenure	10.771 (9.053)	8.654 (7.447)	11.806 (9.574)
Union (Dummy)	0.253 (0.435)	0.243 (0.429)	0.259 (0.438)
Married (Dummy)	0.597 (0.491)	0.417 (0.493)	0.686 (0.464)
Weekly working hours	40.734 (2.065)	40.097 (2.952)	41.045 (1.34)
No management position	0.655 (0.475)	0.764 (0.425)	0.602 (0.49)
Lowest management	0.126 (0.332)	0.133 (0.339)	0.122 (0.328)
Lower management	0.134 (0.341)	0.078 (0.269)	0.162 (0.368)
Middle management	0.067 (0.25)	0.022 (0.146)	0.089 (0.285)
Top and upper management	0.018 (0.131)	0.003 (0.054)	0.025 (0.155)

Notes: The firm and individual data are drawn from the Swiss Earnings Structure Survey 1994-1998. Standard errors are in parenthesis.

Table A.6:
SUMMARY STATISTICS: PERFORMANCE PAY WORKERS

Variable	All	Female	Male
Log performance comp.	5.471 (1.240)	5.298 (1.115)	5.549 (1.282)
Log time-based comp.	8.758 (0.404)	8.508 (0.343)	8.863 (0.381)
Female (Dummy)	0.297 (0.457)	1.000 (0.000)	0.000 (0.000)
Firm entry age	29.783 (8.05)	29.203 (8.622)	29.310 (7.796)
Education in years	12.692 (2.418)	11.740 (2.178)	13.093 (2.402)
Tenure	11.776 (8.946)	9.459 (7.446)	12.753 (9.337)
Union (Dummy)	0.195 (0.396)	0.203 (0.402)	0.192 (0.394)
Married (Dummy)	0.627 (0.484)	0.427 (0.495)	0.711 (0.453)
Weekly working hours	40.779 (1.976)	40.124 (2.957)	41.057 (1.268)
No management position	0.548 (0.498)	0.688 (0.463)	0.489 (0.500)
Lowest management	0.143 (0.350)	0.164 (0.37)	0.133 (0.340)
Lower management	0.198 (0.399)	0.116 (0.319)	0.233 (0.423)
Middle management	0.092 (0.289)	0.030 (0.171)	0.118 (0.323)
Top and upper management	0.019 (0.137)	0.002 (0.047)	0.026 (0.160)

Notes: The firm and individual data are drawn from the Swiss Earnings Structure Survey 1994-1998. Standard errors in paranthesis.