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Minimum Wage: Redistributive or Discriminatory Policy?

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Martin Micheli[1]

Minimum Wage: Redistributive or Discriminatory Policy?

Abstract

The standard model of optimal minimum wage policy in a perfectly competitive labor market suggests that a positive tax rate on minimum wage income is Pareto inefficient. However, most countries with minimum wage legislation exhibit a positive tax rate on minimum wage income. We solve this alleged puzzle by introducing discrimination of individuals that do not contribute to social welfare, typically individuals that do not participate in the political process, into the standard model. If minimum wages serve discriminatory purposes, a positive tax rate on minimum wage income can be compatible with optimal government policy. In the empirical part, we show that the share of inhabitants approving of labor market discrimination against immigrants and against women is positively related to the presence of minimum wage legislation in the respective country.

JEL Classification: E24, J31, J71, J78

Keywords: Minimum wage; discrimination

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1 Introduction

For many decades, there had been a consensus among economists that minimum wages increase unemployment among teenagers and young adults (Brown et al., 1982; Alston et al., 1992) and are therefore not advisable. Katz and Krueger (1992) and Card and Krueger (1994) challenge this view. Card and Krueger (1994) evaluate an increase in New Jersey's minimum wage and do not find negative employment effects, which lead to a debate on the employment effects of minimum wages (Neumark and Wascher, 2000; Card and Krueger, 2000). Many subsequent studies investigate the economic effects of statutory minimum wages in the US (Dube et al., 2007, 2010; Allegretto et al., 2011; Giuliano, 2013), the UK (Machin et al., 2003; Stewart, 2004; Draca et al., 2011), or collectively bargained minimum wages for certain branches like in Germany (König and Möller, 2009; Aretz et al., 2013; Boockmann et al., 2013; Frings, 2013). Bossler and Gerner (2016) evaluate the introduction of a statutory minimum wage in Germany in 2015. Despite this multitude of studies, the literature on the effects of minimum wages has not yet reached a consensus.[1]

If employment effects of minimum wages are negligible, minimum wages might be a useful tool to redistribute income. However, surprisingly little is known about the welfare effects of minimum wages, especially in combination with alternative redistributive policies such as tax and transfer schemes. Cahuc and Laroque (2014) analyze the effect of minimum wages in a monopsonistic labor market. They show that minimum wages can increase welfare. However, under the realistic assumption of a continuum of wages at the bottom of the wage distribution, minimum wages are suboptimal. The authors argue that minimum wages might still be useful if the space of permissible policies is restricted. In a search and matching framework, welfare effects of minimum wages depend on the relative market power of employers and employees (Flinn, 2006). Considering competitive labor markets, Lee and Saez (2012) show that minimum wages can be welfare improving. One necessary condition is that minimum wage earners face negative tax rates. This however, is in contrast to observed positive tax rates for respective incomes in OECD countries (Immervoll, 2007). In case of positive tax rates on minimum wage income however, minimum wages are second best Pareto inefficient (Lee and Saez, 2012).

This raises the question of whether there might be another motivation for the pop-

[1] The Initiative on Global Markets (IGM) regularly surveys the views of leading economists on economic issues (http://www.igmchicago.org). In a survey in 2013, 34% agreed, 32% disagreed with the statement: "Raising the federal minimum wage to $9 per hour would make it noticeably harder for low-skilled workers to find employment." In 2015, 21% agreed, 24 % disagreed with the statement: "If the federal minimum wage is raised gradually to $15-per-hour by 2020, the employment rate for low-wage US workers will be substantially lower than it would be under the status quo.", reflecting the current dissent in the literature.

ularity of minimum wages in many countries. Concerning the demand side of the labor market, minimum wages might be a tool to keep lower paying competitors out of the market (Haucap et al., 2001). Bachmann et al. (2014) show that the support for – on the sectoral level bargained – minimum wages in Germany is indeed stronger in industries and regions with low barriers to market entry and among firms that already pay collectively bargained wages. For the supply side, minimum wages might be a tool to keep low qualified minorities out of the labor market. Historically, minimum wages have often been used in such a way. Sowell (2013) reports that in the past, minimum wages have been used to price immigrants out of the labor market, e.g. in Canada, Australia, South Africa, and the United States. Sumner (2015) asks whether even nowadays, the at that time planned minimum wage increase in Britain might be used to keep certain population groups out of the labor market.

This paper contributes to the literature by showing that positive tax rates on minimum wage income, which have been diagnosed as second best Pareto inefficient (Lee and Saez, 2012), can be an optimal policy mix from the government's perspective. We augment the Lee and Saez-Model by a low qualified minority that is not an argument in the government's social welfare function, reflecting the absence of this minority's political weight. If the majority group enjoys preferential treatment in the labor market, positive tax rates on minimum wage income can be Pareto optimal. The mechanism is the following. Due to perfect competition, the introduction of minimum wages results in labor rationing. If firms fill vacancies with individuals from the majority group first and only then hire individuals from the minority, the majority group does not suffer from job uncertainty due to labor rationing but benefits from higher wages due to minimum wage legislation. Minimum wages therefore increase the welfare of the majority at the expense of the minority. We assess such a hiring scheme as discriminatory. In the Lee and Saez-Model, individuals do not differ with respect to productivity. Firms should therefore be agnostic with respect to hiring a low qualified individual from the minority or the majority group. Discriminatory hiring, however, is a necessary condition for Pareto optimality.

Employing a cross country analysis, we first show that the approval of such discriminatory hiring schemes is, depending on the discriminated group, widespread in OECD countries. We consider the case of labor market discrimination against foreigners and against women. We then show that the approval the discriminatory hiring is positively correlated with the presence of minimum wage legislation. This correlation is especially strong for the approval of discrimination against foreigners.

2 Model

This section analyzes the conditions under which a minimum wage is welfare improving. We use the model of optimal minimum wage policy in a perfectly competitive labor market (Lee and Saez, 2008, 2012). There are two household types, high and low skilled individuals, which are imperfect substitutes in the production process. We extend the model by introducing heterogeneity among low skilled individuals. There are low skilled individuals that participate in the political process and those that do not. Non-politically participating individuals do not contribute to the government's social welfare function.[2] We analyze welfare effects of minimum wages if non-participating low skilled individuals face discrimination in the labor market. We refer to individuals that contribute to the social welfare function as participating (p) and individuals that are not an argument in the social welfare function as non-participating (n) individuals.

2.1 Demand Side

Production takes place at perfectly competitive firms. There are two input factors in the production process, low skilled labor h_l and high skilled labor h_h. Firms combine these two input factors and produce consumption goods according to a production function $F(h_l, h_h)$. Firms maximize real profits $\Pi = F(h_l, h_h) - w_l h_l - w_h h_h$ with w being the skill dependent wage rate. The two types of low skilled labor, politically participating and non-participating workers, are perfect substitutes. This simple setup results in an identical wage for participating and non-participating low skilled workers and the standard condition for the two factor prices

$$w_i = \frac{\partial F}{\partial h_i} \tag{1}$$

holds for $i \in \{l, h\}$. Constant returns to scale result in workers receiving all of the firms' income, firms' profits are zero ($\Pi = 0$). We further assume that high skilled workers are more productive than low skilled ones. The wage for high skilled work therefore exceeds the one of low skilled work ($w_l < w_h$).

2.2 Supply Side

There are two types of individuals, high skilled h_h^0 and low skilled h_l^0. All high skilled individuals belong to the majority group. Low skilled individuals consist of individuals belonging to the politically participating majority h_{lp}^0 and the non-participating minority

[2] We interpret social welfare as the weighted sum of politically participating individuals' welfare.

h^0_{ln}. We normalize the population such that $h^0_h + h^0_l = h^0_h + h^0_{lp} + h^0_{ln} = 1$. Each individual faces a cost of working θ. This cost of working is smoothly distributed for each group with the cumulative distribution function $P_h(\theta)$ for high skilled individuals and $P_{lp}(\theta)$ and $P_{ln}(\theta)$ for politically participating and non-participating low skilled ones. This setup results in three possible labor market states. Individuals that do not work (h_0) consist of high skilled as well as politically participating and non-participating low skilled individuals. Low skilled workers h_l consist of participating and non-participating low skilled individuals. High skilled workers h_h consist of high skilled individuals, which all belong to the politically participating majority.

All individuals make a binary labor supply decision. Individuals want to work if the cost of working is lower than the additional after tax labor income $\theta \leq (1 - \tau_i) w_i$ with the occupation specific tax rate τ_i with $i \in \{l, h\}$. All individuals in the economy receive lump sum transfers c_0. Therefore, disposable income for employed high and low skilled individuals is given by $c_i = c_0 + (1 - \tau_i) w_i$. A negative tax rate τ_i represents a labor subsidy. Individuals that do not work only receive lump sum transfers c_0.

Aggregate labor supply for high and low skilled individuals is increasing in labor income. The number of individuals that are willing to work for a given after tax labor income is given by

$$h^0_i P_i \left((1 - \tau_i) w_i \right) = h^0_i P_i \left(c_i - c_0 \right) \tag{2}$$

with $i \in \{h, lp, ln\}$.

2.3 Equilibrium

Combining the labor market's supply and demand side defines an undistorted equilibrium for wages w_l, w_h and the shares of individuals that are working h_{lp}, h_{ln}, h_h. Let us define demand functions for participating and non-participating low skilled workers, $D_{lp}(w_l) = h_{lp}$ and $D_{ln}(w_l) = h_{ln}$. Conditional on an exogenous minimum wage for low skilled workers w_l, these labor demand functions pin down demand for low skilled labor. Constant returns to scale in combination with equations (1) and (2) then determine hours worked and the corresponding competitive wage for high skilled workers.

2.4 Government Social Welfare Objective

The government evaluates social welfare given a social welfare function SW. It values disposable income of politically participating individuals given the concave function $G(c)$. The concavity either represents individuals' decreasing marginal returns of income or

the government's preference for redistribution (Lee and Saez, 2012). The social welfare function cumulates the government-evaluated income of not employed participating individuals, low skilled participating and high skilled workers. We thereby follow Benhabib (1996), who assumes that only the politically active majority determines policies.

$$SW = \left(1 - h_{lp} - h_{ln}^0 - h_h\right) G\left(c_0\right) + h_{lp}^0 \int G\left(c_{lp} - \theta\right) p_{lp}^0\left(\theta\right) d\theta + h_h^0 \int G\left(c_h - \theta\right) p_h^0\left(\theta\right) d\theta \quad (3)$$

The distribution functions p_{lp}^0 and p_h^0 give the probability that an individual is willing to work.

All individuals in the economy receive lump sum transfer c_0. These transfers are financed via labor taxes. As in Lee and Saez (2012), the government only observes whether an individual is employed and in which sector. Individual disutility from working θ is not observable. Tax rates τ_i are therefore linked to whether an individual works in the high or in the low skill sector with $\tau \in \{l, h\}$. The government faces the budget constraint

$$h_{lp}\tau_l w_l + h_{ln}\tau_l w_l + h_h \tau_h w_h = c_0 \; . \quad (4)$$

2.5 Desirability of a Minimum Wage

Evaluating the desirability of a minimum wage should be considered in the context of all available policies. The government maximizes the social welfare function (equation 5) by setting a minimum wage ($\bar{w}$, the wage for low skilled workers). Besides the minimum wage, the government controls transfers c_0 and the occupation-specific tax rates τ_l and τ_h. As wages are occupation specific, control over the tax rates is equivalent to setting disposable income for the different occupational groups. We define the additional income due to working as $\Delta c_h = c_h - c_0$ and $\Delta c_l = c_l - c_0$. The additional income for low skilled workers is independent of political participation $\Delta c_l = \Delta c_{lp} = \Delta c_{ln}$.

$$SW = \left[1 - D_{lp}(\bar{w}) - h_{ln}^0 - h_h^0 P_h(\Delta c_h)\right] G\left(c_0\right) + D_{lp}(\bar{w}) \int_0^{\Delta c_l} G\left(c_0 + \Delta c_l - \theta\right) \frac{p_{lp}(\theta)}{P_{lp}(\Delta c_l)} d\theta + h_h^0 \int_0^{\Delta c_h} G\left(c_0 + \Delta c_h - \theta\right) p_h(\theta) d\theta \quad (5)$$

As individuals are heterogeneous with respect to their disutility from working, individuals for which the cost of working is greater than the increase in disposable income due to working do not work. For high skilled workers, individuals with $\theta \leq \Delta c_h$ are willing to

work, resulting in the fraction $P_h(\Delta c_h)$ of high skilled individuals working. Therefore, integration of the second integral in equation (5) goes from $\theta = 0$ to $\theta = (1-\tau_h)w_h = \Delta c_h$. For low skilled individuals, the masses $P_{lp}(\Delta c_l)$ and $P_{ln}(\Delta c_l)$ of low skilled individuals are willing to work, given working results in additional labor income of Δc_l. However, if the minimum wage is binding, labor demand is below labor supply, resulting in labor rationing. We assume that labor rationing is uniform within each subgroup. Each individual within a group that is supplying labor has the same probability of being hired. Therefore, integration of the first integral in equation (5) goes from $\theta = 0$ to $\theta = \Delta c_l$, thereby covers all participating low skilled individuals that are willing to work. That takes into account that not all low skilled participating individuals which are willing to work are necessarily working. The integral represents the average utility of low skilled participating individuals that are working at wage $\bar{w}$.

The government faces the budget constraint

$$D_{lp}(\bar{w})(\bar{w} - \Delta c_l) + D_{ln}(\bar{w})(\bar{w} - \Delta c_l) + h_h^0 P_h(\Delta c_h)(w_h - \Delta c_h) = c_0 \; . \tag{6}$$

Lump sum transfers cannot increase indefinite but have to be financed via labor taxes. The government therefore chooses a tax and transfer scheme (c_0, Δc_l, Δc_h) to maximize social welfare (equation 5).

Let us briefly recapitalize the result of Lee and Saez (2008), positive tax rates on minimum wage income being Pareto inefficient.[3] Note that under the assumption of no minority in the economy ($h_{ln}^0 = 0$), a necessary condition for a minimum wage to be Pareto optimal is

$$-\frac{\tau_l}{1-\tau_l} = \frac{\int_0^{\Delta c_l} (G(c_0 + \Delta c_l - \theta) - G(c_0)) p_{lp}(\theta) d\theta}{\lambda \int_0^{\Delta c_l} (\Delta c_l - \theta) p_{lp}(\theta) d\theta} \int_0^{\Delta c_l} \left(1 - \frac{\theta}{\Delta c_l}\right) \frac{p_{lp}(\theta)}{P_{lp}(\Delta c_l)} d\theta \; , \tag{7}$$

which corresponds to equation (22) in Lee and Saez (2008). λ represents the Lagrangian multiplier for the government's budget constraint.

As low skilled individuals can decide not to work if disutility from working exceeds the benefit from the additional labor income, $\Delta c_l \geq \theta$ has to hold for working low skilled individuals. This directly implies that the right hand side of equation (7) is always positive. A necessary condition for equation (7) to hold therefore is that $\frac{\tau_l}{\tau_l - 1}$ is negative, which is only satisfied for negative tax rates on minimum wage income. A minimum wage

[3] In the published version (Lee and Saez, 2012), Lee and Saez assume efficient rationing and claim that their results remain true for non efficient rationing. In the corresponding working paper (Lee and Saez, 2008), the authors prove this claim for the case of uniform rationing, which we employ in this paper.

is therefore second best Pareto inefficient if minimum wage workers face positive tax rates (Lee and Saez, 2008, 2012).

Allowing for a politically not participating minority implies that a necessary condition for a minimum wage to be Pareto efficient is

$$-\frac{\tau_l}{1-\tau_l}\left(1+\frac{D'_{ln}(\bar{w})}{D'_{lp}(\bar{w})}\right) = \frac{\int_0^{\Delta c_l}(G(c_0+\Delta c_l-\theta)-G(c_0))p_{lp}(\theta)d\theta}{\lambda\int_0^{\Delta c_l}(\Delta c_l-\theta)p_{lp}(\theta)d\theta}\int_0^{\Delta c_l}\left(1-\frac{\theta}{\Delta c_l}\right)\frac{p_{lp}(\theta)}{P_{lp}(\Delta c_l)}d\theta\,. \quad (8)$$

We present a detailed derivation of this equation in the Appendix. Equation (8) shows that the tax rate on minimum wage income (τ_l) is crucial for whether or not a minimum wage can be welfare improving. Again, the right hand side of equation (8) is always positive due to the choice of not working if work effort exceeds the benefit of working. In case of two types of low skilled individuals in the economy, the desirability of minimum wages depends on the tax rate for minimum wage income and the ratio of the change in labor demand for the two types of low skilled workers – which corresponds to the number of employees of the respective group – given a marginal increase in the wage for low skilled workers above the market-clearing wage $\left(D'_{ln}(\bar{w})/D'_{lp}(\bar{w})\right)$. We therefore want to give an interpretation of this term and explain how it relates to discrimination.

Assume that there is no discrimination between participating and non-participating low skilled individuals in the labor market. Due to a competitive labor market, total labor demand decreases given a marginal increase in the minimum wage. If employers are indifferent between the two types of low skilled workers, labor demand for both types should be downward sloping. Therefore, the fraction $D'_{ln}(\bar{w})/D'_{lp}(\bar{w})$ should be positive in all cases. Again, a minimum wage can only be desirable in case of a negative tax rate on low wage income.

However, the empirically relevant case of a positive tax rate might be more interesting. Still, a necessary condition for a minimum wage to be desirable is that the left hand side of equation (8) is positive. Given a positive tax rate, $\frac{\tau_l}{\tau_l-1}$ is always negative. Therefore, a necessary condition for a minimum wage to be welfare improving is that $D'_{ln}(\bar{w})/D'_{lp}(\bar{w})$ is smaller than -1.

$D'_{ln}(\bar{w})/D'_{lp}(\bar{w})$ can only be negative if one group of low skilled workers faces job losses due a minimum wage increase while employment among the other group increases. As a minimum wage results in total job losses, we know that $D'_{ln}(\bar{w})+D'_{lp}(\bar{w})<0$. Employers can choose among job applicants due to a minimum wage driven supply overhang.

Consider that employers prefer politically participating workers and therefore fill vacancies first with participating individuals ($D'_{lp}(\bar{w}) > 0$). Non-participating individuals only have access to jobs after all participating individuals that are willing to work at a given minimum wage are served ($D'_{ln}(\bar{w}) < 0$). Due to $D'_{ln}(\bar{w}) + D'_{lp}(\bar{w}) < 0$, we also know that $D'_{ln}(\bar{w})/D'_{lp}(\bar{w}) < -1$. We interpret this preferential treatment of participating individuals, even though there is no objective reason for an employer to have a preference for participating individuals, as discrimination. We thereby show that a minimum wage can be an optimal government policy if individuals that do not contribute to social welfare are discriminated in the labor market. Note that this discrimination is a necessary condition for a minimum wage to be optimal under positive tax rates on minimum wage income, not a sufficient one.[4]

Proposition: *Assuming uniform rationing and $D'_i(\Delta c_i) > -\infty$ for $i \in \{lp, ln\}$, a minimum wage can be desirable if there is discrimination in the labor market against individuals that do not contribute to social welfare.*

3 Estimation and data

Equation (8) implies that minimum wages can be an optimal policy from the government's perspective even under positive tax rates on minimum wage income. However, a necessary condition is that firms first hire politically participating individuals and only then revert to members of the non-participating minority. We therefore expect a positive correlation between the approval of discrimination against non-politically participating individuals and the presence of minimum wage legislation.

To test for this proposed correlation, we perform a cross-country analysis. We investigate two groups that potentially are subject to labor market discrimination: Immigrants and women. Historically, minimum wage policies have often been introduces to price immigrants out of the labor market (Sowell, 2013). Immigrant's low weight in the political process results first, from being a minority and political decision typically represent the preferences of median voter and second, from not being able to vote. For women, the case is less obvious. However, labor market discrimination is one explanation for the wage difference between men and women (Altonji and Blank, 1999) and lower political participation of women is well documented in the literature (Clark and Clark, 1986).

[4]Even though there is no incidence for the empirical relevance of employers preferring non-participating workers ($D'_{ln}(\bar{w}) > 0$) and only remaining vacancies are filled with participating individuals ($D'_{lp}(\bar{w}) < 0$), we want to show the effect on the desirability of a minimum wage. In such a case, $D'_{ln}(\bar{w})/D'_{lp}(\bar{w}) > -1$ due to $D'_{ln}(\bar{w}) + D'_{lp}(\bar{w}) < 0$. Therefore, a minimum wage cannot be optimal given a positive tax rate for minimum wage income.

We estimate the following regression equation

$$y_{it} = \beta_0 + \beta_d d_{it} + \beta_x x_{it} + \gamma_t + \varepsilon_{it} \ , \tag{9}$$

where y indicates the presence of a minimum wage and d_{it} represents the measure for approval of discrimination against the respective group. x are additional control variables, γ_t represents time fixed effects, and ϵ_{it} is the error term, which is clustered on the country level. i and t indicate the respective country and time period.

Information on the approval of discrimination is taken from the World Values Survey (WVS). The WVS is an internationally conducted nationally representative household survey that covers almost 100 countries, roughly representing 90% of the world's population (World Values Survey, 2014). The countries that participate in the survey change over time. This paper uses the percentage of respondents in each country that agree to the statement: "When jobs are scarce, employers should give priority to people of this country over immigrants." as measure for approval of discrimination against immigrants.[5] With regard to the measure of approval of discrimination against women, we use the percentage of respondents in each country that agree to the statement: "When jobs are scarce, men should have more right to a job than women."[6] Note that these questions directly correspond to the implications of equation (8) in Section 2.5: a positive tax rate on minimum wage income can only be Pareto optimal if jobs are first given to the politically participating majority and only then to the discriminated minority.

As measure for minimum wage legislation, we use the presence of a statutory and national minimum wage, which corresponds to the OECD definition. We restrict our sample to OECD countries. One benefit of this choice, besides data availability issues, is that OECD countries are committed to democracy such that the approval of discrimination among citizens should have an effect on legislation. Information on the presence of a minimum wages is retrieved from Gräf et al. (2014, p. 10), the OECD, and Neumark and Wascher (2007).

To control for other factors that might affect the presence of minimum wage legislation, we use log GDP per capita adjusted for differences in purchasing power, log population density measured by the number of inhabitants per square kilometer, the unemployment rate in percent, the share of foreign population defined by the country of birth in percent,

[5] This is the exact statement that is included in wave 6 (variable V46 with one observation between the years 2010 to 2014). Similar statements are included in waves 2-5. Each wave covers about 5 years resulting in a sample period from 1990 (first year of wave 2) to 2014 (last year of wave 6).

[6] This is the exact statement that is included in wave 6 (variable V45 with one observation between the years 2010 to 2014). Similar statements are included in waves 2-5.

and the female labor force participation rate in percent. All information is publicly available at the OECD.

As one WVS wave corresponds to a time period of about five years, control variables represent information on the year the respective WVS wave was conducted in the respective country. Table 1 shows for which countries there is information on the approval of discrimination and the presence of a minimum wage. Figure 1 shows the distribution of our two measures of discrimination. Descriptive statistics are presented in Table 2. For 76 percent of the observations in our sample, there is minimum wage legislation. With respect to labor market discrimination against immigrants, the average approval across countries is 57 percent. It is relatively low in the Nordic countries Sweden and Norway and in the Netherlands. The upper tail of the distribution represents countries in eastern Europe. Approval of discrimination against women is less widespread. On average, 23 percent of the population approve such discrimination. Again, Sweden is the country with the lowest approval rates. Approval of labor market discrimination against women is strongest in Turkey.

4 Results

We estimate equation (9) using OLS, standard errors are clustered on the country level.[7] First, we estimate equation (9) for explaining the presence of minimum wage legislation by approval of discrimination against immigrants. Results are reported in Table 3. Using only discrimination as explanatory variable, we find a significant positive correlation between the approval of labor market discrimination against immigrants and the presence of a statutory minimum wage (1). A 1 percentage point higher share of individuals that approve of discrimination is associated with a 1.2 percentage point higher probability for the presence of minimum wage legislation. We proceed by allowing for a nonlinear relation. The increase in the probability of minimum wage legislation that is associated with an increase in the approval of discrimination might be highest when about half of the population approves of discrimination. As we focus on countries that are committed to democracy, half of the population supporting a policy should be a threshold value for

[7]We are not able to include country fixed effects, which would allow for more causal interpretation of our results. There practically is no variation with respect to the presence of a minimum wage in the different countries in our sample, prohibiting country fixed effects. There is only one country that exhibits a change in the minimum wage status. In the UK, there was no minimum wage in 1998 while a minimum wage had been introduced in 2005. Additionally to that, we assess the potential country fixed effect to capture an important part of the connection between the presence of a minimum wage and the views towards discrimination. However, not being able to include country fixed effects comes at the price of identifying a correlation and not a causal effect.

passing legislation.[8] We therefore include the second order polynomial of discrimination (2). The correlation between the joint effect of the first and second order polynomial and discrimination is highly significant. To assess whether the correlation is positive or negative and its magnitude, we show the marginal correlations at the 10th, 25th, 50th, 75th, and 90th percentile of the distribution of discrimination. The correlation is highly significant and positive at the lower end of the distribution. At the median, which corresponds to 56.2 percent of individuals approving of discrimination, a one percentage point higher approval is again associated with a 1.2 percentage points higher probability of minimum wage legislation. Including time fixed effects (3) that control for the effect of the respective WVS wave does not change the results. We also include various co-variates to control for macroeconomic effects that might affect the occurrence of a minimum wage.[9] However, neither of the covariates affects the positive correlation. The marginal effect ceases to be significant only for the upper tail of the distribution of discrimination. These results are robust to employing a probit estimator.

In a second step, we investigate the correlation between minimum wage policies and the approval of discrimination against women. Table 4 shows the analysis explaining the presence of minimum wage legislation by the approval of labor market discrimination against women. The structure is similar to Table 3.[10] We find a significant positive correlation. A 1 percentage point higher share of individuals approving discrimination against women is associated with a 1 percentage point higher probability of the presence of minimum wage legislation (2). There are two exceptions: the regressions using ppp adjusted per capita GDP (4) and the females labor force participation rate (7). However, both variables are negatively correlated with discrimination.[11] Discrimination against women might result in less women participating in the labor market and therefore in lower GDP per capita. Both control variables therefore capture parts the positive correlation between discrimination and minimum wage legislation. However, our model only makes predictions about the correlation between the two variables. We are therefore agnostic with respect to the driver of this correlation, whether there is a causal interpretation or whether the correlation is a manifestation of a common factor, controlling for GDP and

[8] This 50 percent threshold might not be a sharp as – with the exception of Switzerland – individuals do not directly decide about policies but elect individuals or parties, where the views about discrimination are only one issue in a whole range of issues. Additionally to that, the WVS is representative of the population, not the individuals that participate in elections.

[9] These are the log of purchasing power adjusted per capita GDP, the log of population density, the unemployment rate and the foreign population share in percent.

[10] Instead of using the share of the foreign population we use the female labor force participation rate as control variable. The results are robust to estimating equation (9) using a probit estimator.

[11] For GDP the correlation is -0.71, for the share of females in the labor force the correlation is -0.79.

the female labor force participation rate is indicative of.

5 Concluding Remarks

If the government uses minimum wage legislation as a redistributive policy, it should first abandon contradictory policies such as taxes on low wage incomes. In the standard model of optimal minimum wage policy in a perfectly competitive labor market (Lee and Saez, 2008, 2012), the empirically relevant case of a positive tax rate on minimum wage income is second best Pareto inefficient.

However, a Pareto inefficient policy mix in most OECD countries with minimum wages seems somewhat puzzling and raises questions about the aims of such a policy. Historically, minimum wages have often been used to discriminate against certain population groups (Sowell, 2013). Introducing such discrimination into this standard model and assuming uniform rationing, we show that a positive tax rate on minimum wage income can be an optimal government policy. One necessary condition is that politically participating individuals are treated favorably in the labor market. Then, these individuals can expect to benefit from higher wages and not to suffer from employment losses, as the burden of minimum wage legislation is inflicted on less politically active individuals. Even though such a policy mix might be desirable from a government perspective, this results in lower average welfare for all inhabitants. We therefore have our doubts that such a policy should be perused.

Employing a cross-country analysis, we find evidence for a positive correlation between the presence of a minimum wage legislation on the one hand and the approval of labor market discrimination against immigrants and against women on the other hand, which is a prediction of our model. We thereby offer an alternative explanation for widespread positive tax rate on minimum wage income than a Pareto inefficient policy mix.

Note that we do not claim to have uncovered a causal effect. Even though we asses the driver of this correlation to be an interesting question, we leave this for further research.

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Figure 1: Approval of discrimination

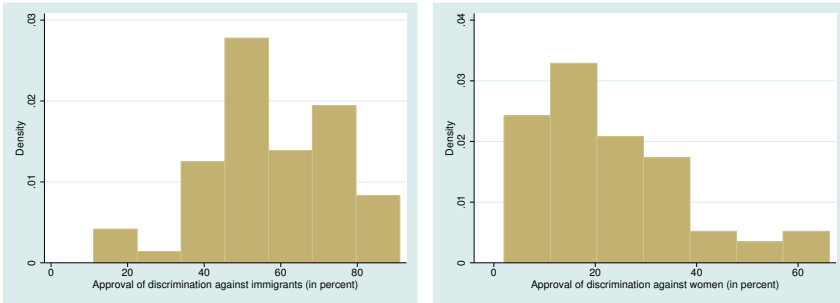

Table 1: Data Availability

	WVS Wave				
	1990-1994	1995-1999	2000-2004	2005-2009	2010-2014
Australia		x		x	x
Canada			x	x	
Chile					x
Czech Republic		x			
Estonia					x
Finland		x		x	
France				x	
Germany		x		x	x
Great Britain		x		x	
Hungary		x		x	
Italy				x	
Japan	x	x	x	x	x
South Korea		x	x	x	x
Mexico		x	x	x	x
Netherlands				x	x
New Zealand		x		x	x
Norway		x		x	
Poland		x		x	x
Slovenia					x
Spain	x	x	x	x	x
Sweden		x	x	x	x
Switzerland		x		x	
Turkey	x	x	x	x	x
United States		x	x	x	x

Note: An 'x' indicates that information on the approval of discrimination and on the presence of a minimum wage is available.

Table 2: Descriptive statistics

	Mean	SD	Min	Max	Observations
Presence of minimum wage	0.76		0	1	63
Discrimination of Immigrants	57.49	17.97	11.1	91.1	63
Discrimination of Women	22.56	14.73	2.0	66.2	63
1990-1994					3
1995-1999					17
2000-2004					8
2005-2009					20
2010-2014					15
log(GDP per capita)	10.25	0.42	9.29	11.01	63
log(population density)	4.20	1.41	0.85	6.21	63
Unemployment rate	7.47	4.18	2.01	21.41	58
Share of foreigners	11.50	7.22	0.50	27.33	43
Female labor force participation rate	69.58	15.39	28.04	88.36	63

Table 3: Explaining the presence of a minimum wage by approval of discrimination immigrants

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Discrimination	0.0116***	0.0288***	0.0265**	0.0295***	0.0275***	0.0305***	0.0543***
	(0.0031)	(0.0088)	(0.0099)	(0.0103)	(0.0097)	(0.0092)	(0.0148)
Discrimination^2		-0.0002*	-0.0001	-0.0002**	-0.0001	-0.0002*	-0.0001
		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
GDP				-0.3135			
				(0.1904)			
Population density					-0.0530		
					(0.0614)		
Unemployment						-0.0082	
						(0.0127)	
Foreign population							0.0127
							(0.0158)
Time FE	No	No	Yes	Yes	Yes	Yes	Yes
Joint significance of discrimination[a]		22.90***	19.69***	5.06**	12.53***	22.93***	15.51***
Marginal effect of approval of discrimination at[b]							
p(10) = 38.3%		0.0165***	0.0166***	0.0139***	0.0181***	0.0174***	0.0178**
		(0.0027)	(0.0031)	(0.0044)	(0.0037)	(0.0028)	(0.0032)
p(25) = 48.4%		0.0133***	0.0140***	0.0098**	0.0156***	0.0140***	0.0149***
		(0.0020)	(0.0023)	(0.0037)	(0.0033)	(0.0021)	(0.0036)
p(50) = 56.2%		0.0108***	0.0120***	0.0066*	0.0137***	0.0113***	0.0127**
		(0.0024)	(0.0027)	(0.0038)	(0.0037)	(0.0027)	(0.0051)
p(75) = 70.5%		0.0062	0.0083	0.0007	0.0101*	0.0065	0.0086
		(0.0043)	(0.0048)	(0.0051)	(0.0056)	(0.0048)	(0.0087)
p(90) = 78.8%		0.0036	0.0061	-0.0026	0.0081	0.0036	0.0062
		(0.0056)	(0.0063)	(0.0063)	(0.0069)	(0.0062)	(0.0109)
Observations	63	63	63	63	63	58	43

Note: All estimations include a constant. On the country level clustered standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. [a] F-statistic. [b] The distribution refers to the distribution of the full sample with 63 observations.

Table 4: Explaining the presence of a minimum wage by approval of discrimination against women

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Discrimination	0.0098**	0.0207	0.0284	0.0202	0.0403**	0.0377*	0.0230
	(0.0047)	(0.0178)	(0.0183)	(0.00209)	(0.0191)	(0.0218)	(0.0173)
Discrimination^2		-0.0002	-0.0003	-0.0003	-0.0004*	-0.0005	-0.0003
		(0.0002)	(0.0002)	(0.0003)	(0.0002)	(0.0003)	(0.0002)
GDP				-0.4026*			
				(0.2152)			
Population density					-0.0762		
					(0.0539)		
Unemployment						-0.0020	
						(0.0121)	
Female labor force participation rate							-0.0115*
							(0.0060)
Time FE	No	No	Yes	Yes	Yes	Yes	Yes
Joint significance of discrimination[a]		3.97**	4.43**	0.76	4.28**	3.81**	1.33
Marginal effect of approval of discrimination at[b]							
p(10) = 6.9%		0.0182	0.0246	0.0164	0.0345**	0.0315*	0.0182
		(0.0145)	(0.0150)	(0.0175)	(0.0159)	(0.0172)	(0.0144)
p(25) = 12.2%		0.0162	0.0216*	0.0135	0.0301**	0.0267*	0.0146
		(0.0120)	(0.0125)	(0.0148)	(0.0134)	(0.0138)	(0.0123)
p(50) = 18.1%		0.0141	0.0183*	0.0103	0.0252**	0.0214**	0.0105
		(0.0092)	(0.0098)	(0.0119)	(0.0107)	(0.0100)	(0.0100)
p(75) = 30.2%		0.0097**	0.0116**	0.0037	0.0151**	0.0105**	0.0022
		(0.0040)	(0.0045)	(0.0062)	(0.0054)	(0.0039)	(0.0063)
p(90) = 43.0%		0.0050	0.0044	-0.0033	0.0044	-0.0011	-0.0067
		(0.0042)	(0.0037)	(0.0034)	(0.0035)	(0.0082)	(0.0061)
Observations	63	63	63	63	63	58	63

Note: All estimations include a constant. On the country level clustered standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. [a] F-statistic. [b] The distribution refers to the distribution of the full sample with 63 observations.

Appendix

In this appendix, we derive equation (8). The government chooses a minimum wage that maximizes social welfare (5) subject to the budget constraint (6). The first order condition reads:

$$\frac{dL}{d\bar{w}} = -D'_{ld}(\bar{w})g(c_0) + D'_{lh}(\bar{w})\int_0^{\Delta c_l} G(c_0+\Delta c_l-\theta)\frac{p_{ld}(\theta)}{P_{ld}(\theta)}d\theta$$
$$+\lambda\left[D'_{ld}(\bar{w})(\bar{w}-\Delta c_l) + D'_{lf}(\bar{w})(\bar{w}-\Delta c_l) + D_{ld}(\bar{w}) + D_{lf}(\bar{w}) + h_h^0 P_h(\Delta c_h)\frac{\partial w_h}{\partial \bar{w}}\right] = 0 \tag{A.1}$$

Using $D_{ld}(\bar{w}) + D_{lf}(\bar{w}) + h_h^0 P_h(\Delta c_h)\frac{\partial w_h}{\partial \bar{w}} = 0$ from the non profit condition due to perfect competition in the production sector and rearranging, yields

$$G(c_0) = \int_0^{\Delta c_l} G(c_0+\Delta c_l-\theta)\frac{p_{ld}(\theta)}{P_{ld}(\Delta c_l)}d\theta + \lambda\left[\left(1+\frac{D'_{lf}(\bar{w})}{D'_{ld}(\bar{w})}\right)(\bar{w}-\Delta c_l)\right]. \tag{A.2}$$

As $\bar{w}-\Delta c_l = \frac{\tau_l}{1-\tau_l}\Delta c_l$ and $\int_0^{\Delta c_l}\frac{p_{ld}(\theta)}{P_{ld}(\Delta c_l)} = 1$, we have

$$\int_0^{\Delta c_l}\left[G(c_0+\Delta c_l-\theta)-G(c_0)\right]\frac{p_{ld}(\theta)}{P_{ld}(\Delta c_l)}d\theta = -\lambda\left[\left(1+\frac{D'_{lf}(\bar{w})}{D'_{ld}(\bar{w})}\right)\frac{\tau_l}{1-\tau_l}\Delta c_l\right], \tag{A.3}$$

which we can rewrite to

$$-\frac{\tau_l}{1-\tau_l}\left(1+\frac{D'_{lf}(\bar{w})}{D'_{ld}(\bar{w})}\right) = \frac{\int_0^{\Delta c_l}(G(c_0+\Delta c_l-\theta)-G(c_0))p_{ld}(\theta)d\theta}{\lambda\int_0^{\Delta c_l}(\Delta c_l-\theta)p_{ld}(\theta)d\theta}\int_0^{\Delta c_l}\left(1-\frac{\theta}{\Delta c_l}\right)\frac{p_{ld}(\theta)}{P_{ld}(\Delta c_l)}d\theta, \tag{A.4}$$

which is equation (8) in the main text.