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## The Politicians' Wage Gap: Insights from German Members of Parliament

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# The Politicians' Wage Gap: Insights from German Members of Parliament\*

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Using a unique dataset of German members of parliament with information on total earnings including outside income, this paper analyzes the politicians' wage gap (PWG). After controlling for observable characteristics as well as accounting for selection into politics, we find a positive PWG which is statistically and economically significant. It amounts to 40-60% compared to citizens with an executive position. Hence, we show that the widely held claim that politicians would earn more in the private sector is not confirmed by our data. Our findings are robust with respect to potential unobserved confounders. We further show that the PWG exceeds campaigning costs and cannot be justified by extraordinary workload. Hence, our results suggest that part of the PWG can be interpreted as rent extraction. This calls for a reform of the regulation of outside earnings, which account for a sizeable share of the wage premium.

**JEL Classification:** D72, H11, H83, J31, J45

**Keywords:** politicians' wage gap, descriptive representation, citizen-candidate model, political rents, outside earnings

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# 1 Introduction

An increasing share of the population in Western democracies perceives that the political class has separated itself from the electorate, forming an elitist circle of substantive political power and little accountability (see e.g. Hay, 2007). In addition, growing economic inequality has amplified the general discontent with politicians, since the political elite is said to belong to the top of the income distribution. This perception adds financial jealousy as yet another dimension which separates the average citizen from the political elite (Gilens, 2005; Solt, 2008). A common counterargument is that politicians are more skilled and better qualified than the median voter and therefore have adequately high earnings allowing for returns to education. Thus, there might be positive selection into the “occupation” of a career politician, which explains and justifies a wage premium.

In the literature two main theoretical perspectives on the desirable composition of the political class have been put forward. One stream of literature focuses on descriptive representation (Pitkin, 1972) and emphasizes the notion that a political body exhibiting typical characteristics of the group it represents translates into substantive representation, i.e. having policy preferences in line with those of the electorate. In this view, the distribution of characteristics in the parliament should mirror the one in the electorate. The other strand of the literature explicitly models the interactions between candidate selection, voting behavior and the quality of policy output. Applying citizen candidate frameworks (Osborne and Slivinski, 1996; Besley and Coate, 1997), this stream of research derives necessary conditions that have to be met in order to attract the most able citizens to run for public office (Messner and Polborn, 2004; Caselli and Morelli, 2004). From this perspective a distribution of traits (including earnings) which deviates from the electorate is acceptable. Hence, there could be a trade-off between high remuneration (in order to attract high quality politicians) and descriptive representation. However, higher earnings need not necessarily lead to more qualified politicians (Poutvaara and Takalo, 2007; Kotakorpi and Poutvaara, 2011). In this case, society does not benefit from higher office remuneration. In contrast, rent extraction triggers additional tax burdens.

In this paper we empirically test whether a politicians' wage gap (PWG) exists, i.e. whether German members of parliament (MPs) enjoy a wage premium which cannot be explained by a standard earnings model. The German case is of special interest as the reputation of politicians in Germany seems to be lower than the reputation of most other occupations and has been decreasing for many years (Allensbacher Archiv, 2008). In addition, trust in German politicians is rather low compared to several other European countries (European Social Survey, 2007). However, with its socio-economic and demographic structure, Germany can be seen as a typical Western European democracy. Therefore, the qualitative results of our analysis should be of interest to a wider range of countries.

Our study is conducted on a unique micro dataset of personal and professional information on German MPs, giving detailed insights into their earnings (including office remuneration and outside earnings) as well as their occupation before entering parliament (Becker, Peichl, and Rincke, 2009). We combine these data with the German Socio-Economic Panel Study (GSOEP) – an individual and household panel dataset – which is representative for the German population and thus for the electorate. We proceed in two steps: first, we employ a standard ordinary least squares (OLS) regression to control for observable characteristics that affect earnings. Second, we make use of non-/semi-parametric matching techniques in order to further increase comparability between MPs and voters.

Our results show that the average politician earns more than the average voter, even after controlling for observed characteristics which are commonly identified to affect earnings. Depending on the estimation method and the respective specification applied, the PWG is 70–90% compared to the full sample and declines to 40–60% compared to citizens with an executive position. Hence, we show that the widely used claim that politicians would earn significantly more in the private sector is not confirmed by our data. Interaction effects reveal that the traditional gender wage gap is reversed for female politicians. Moreover, members of leftist parties have a substantively higher wage gap than members of right-wing parties (conditional on observable characteristics). A Rosenbaum bounds sensitivity analysis reveals that the PWG is robust with respect to potential unobserved confounders. We further

show that the PWG exceeds campaigning costs and cannot be justified by the extraordinary workload of MPs. Hence, our results suggest that part of the PWG could be interpreted as rent extraction. This would call for a reform of the remuneration legislation, especially with respect to outside earnings.

In recent decades numerous studies have examined wage differentials between the public and the private sector (see e.g. Ehrenberg and Schwarz, 1987; Bender, 1998; Gregory and Borland, 1999, for overviews). Although most studies concentrate on US data, similar results are obtained for other countries (e.g. Pederson, Schmidt-Sørensen, Smith, and Westergård-Nielsen, 1990; Hartog and Oosterbeek, 1993; Melly, 2005; Gorodnichenko and Peter, 2007). In general, theoretical explanations stress the absence of regulating market forces that empowers bureaucrats to extract rents in the form of uncompetitively high wages in comparison to the private sector (Freeman, 1986; Blank, 1993). To the best of our knowledge, previous studies have focused on public sector employees. So far none has investigated the existence of a *politicians'* wage gap which is the key contribution of our analysis. Closely related to our analysis is the study by Kotakorpi and Poutvaara (2011), who empirically test the effect of an increase in office remuneration on candidate quality in Finland.

The paper is structured as follows. In Section 2 we briefly discuss the theoretical concepts. Section 3 describes the institutional background of the German Bundestag and the data. In Section 4, our empirical strategy is laid out and results are presented. Section 5 discusses the results and Section 6 concludes.

## 2 Theoretical Background and Literature

The degree of representation and its effects on political decision-making have been extensively studied. The theoretical concept is summarized under the term *descriptive representation* characterizing situations in which a group of people is represented by delegates who are typical for this group (Pitkin, 1972). Representation is considered as equitable when the share of politicians with a particular characteristic equals the share of the population with the same characteristic (Lineberry, 1978).

Previous research has provided several arguments why descriptive representation matters and may be desirable from a citizen's point of view. The primary implication is that policy preferences of certain social groups are best advocated by members of the same group. In contrast to the well-known economic model of democracy (Downs, 1957) politicians are presumed to commit to their initial preferences, which are inherently shaped by socio-demographic characteristics and life experiences, throughout the policy-making process. A substantial number of studies supports the notion that descriptive representation may enhance the substantive representation of social subgroups (see e.g. Meier and England, 1984). Other research stresses the significance of descriptive representation with respect to political alienation. Following the model of *political empowerment*, the presence of politicians who exhibit certain socio-demographic characteristics indicates to citizens who share these characteristics that their interests are being taken seriously and that they have support in the legislation process (see e.g. Bobo and Gilliam Jr., 1990). We check whether German MPs are representative for their electorate with respect to several characteristics. In particular, we are interested in the earnings distribution of MPs and voters, and hence the existence of a PWG.

The citizen candidate framework (Osborne and Slivinski, 1996; Besley and Coate, 1997) provides a theoretical argument for justifying a PWG. The framework builds on traditional models of political competition and provides a theoretical approach to explain the number of candidates. By endogenizing the mode of entry, electoral competition is not taken as given, but rather modeled explicitly (Cadigan, 2005). The fundamental implication of citizen candidate models is that initially all citizens are potential candidates who face the same decision: to run or not to run for office. Citizens weigh the potential sunk costs of running for office against the uncertain individual benefits of winning the election. For candidates who have certain abilities that increase the probability of winning the election the expected benefits ultimately exceed the costs and thus they decide to run for office.

Various contributions within this line of research have considered the importance of (monetary and non-monetary) rewards in political office as well as the

selection into career politics.<sup>1</sup> What typically follows from these kinds of models is that citizens of high ability only decide to run for office when the remuneration offered compensates for opportunity costs (forgone potential earnings in the private labor market) as well as the direct costs of candidacy (campaigning costs). This would justify a PWG up to a certain level. Since more able individuals in public office are assumed to provide public goods more efficiently – i.e. at lower costs and hence by setting lower taxes – the electorate should be interested in having competent citizens in political offices (Messner and Polborn, 2004; Caselli and Morelli, 2004). While the previous contributions assume that paying more always results in better politicians, Poutvaara and Takalo (2007) theoretically and Kotakorpi and Poutvaara (2011) empirically analyze the competition between candidates that are members of political parties. These studies show that higher remuneration does not necessarily result in better politicians. In this case, a PWG exceeding campaigning costs would imply rent extraction and would be harmful for voters.

### 3 Institutional Background and Data

The Bundestag is the legislative branch of the German federal political system (together with the Bundesrat, representing the state governments) which is elected for a four-year term. Each eligible voter has two different votes. The first vote is directly attributed to a candidate representing the electoral district. This part of the election has features of the majority voting system. The second vote is for a party which may then, according to its share of party votes, send candidates from predefined electoral lists into the Bundestag. This part of the election has the feature of proportional representation. While each directly elected candidate represents one of the 299 electoral districts, candidates on the party lists can only capture the remaining 299 seats of the Bundestag in accordance with their party's overall share of second votes. There is a minimum threshold of either 5% of the national party vote or three direct mandates. Due to 16 additional surplus mandates, the Bundestag

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<sup>1</sup> See Besley (2004); Mattozzi and Merlo (2008); Gersbach (2009); Braendle and Stutzer (2010); De Paola and Scoppa (2011). For empirical applications see Ferraz and Finan (2009); Gagliarducci and Nannicini (2009); Gagliarducci, Nannicini, and Naticchioni (2010).

comprised a total number of 614 seats in its 16<sup>th</sup> legislative period from October 2005 until September 2009.

The empirical analyses of this work are based on a unique dataset comprising personal and professional information on German MPs, which is an extended and updated version of the data used by Becker, Peichl, and Rincke (2009). We only include MPs who have been members of the Bundestag for the entire period under consideration. Hence, a total of 599 MPs are considered as the base for the following analyses. We extract all available data including biographical and socio-demographic information as well as data on previous occupations and political offices from the MPs' individual Bundestag websites.

We calculate the annual gross earnings as the sum of basic office remuneration, payments for cabinet members, pensions, interim allowances and outside earnings. Each MP is entitled to an appropriate remuneration that ensures financial independence and is determined by the Bundestag itself.<sup>2</sup> Furthermore, MPs who are both members of the Bundestag and the Federal Government are paid extra. When a member of the Federal Government resigns, she is entitled to interim payments for the number of months as a member of the cabinet – a total of at least six months but not more than three years (Bundesministergesetz, 2008). After resigning from office the former minister is entitled to a pension if the position was held for at least two years.<sup>3</sup>

Since 2005 MPs have been legally obliged to disclose information on outside employment (Bundestag, 2010). All MPs have to report professional activities and sources of income, which they pursue outside their political mandate. For each payment it is indicated whether it is received on a regular basis or one-off (Bundestag, 2011). Outside earnings are published according to four categories: (1) below 1,000 euros, (2) 1,000–3,500 euros, (3) 3,500–7,000 euros and (4) more than 7,000 euros.

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<sup>2</sup> With regard to the time period under consideration, the basic remuneration of MPs amounted to 7,009 euros per month from 2005 until 2007 and was increased at the start of 2008 to 7,339 euros per month (Bundestag, 2009).

<sup>3</sup> The amount of interim payment equals the office remuneration including fringe benefits during the first three months of entitlement and half of this amount for the rest of the duration of entitlement. The pension depends on the minister's age and the duration of the ministerial position. In addition, MPs who held a position in the government at the state or local level are entitled to a pension under certain conditions.

The highest category has no upper bound. In order to obtain a measure of outside earnings in the highest category, we follow Becker, Peichl, and Rincke (2009) and assume a level of 12,000 euros, giving us a linearly increasing difference between the category means.<sup>4</sup> Finally, we calculate the amount of outside earnings for each MP by using average values for each category.

All earnings are before taxes and clearly a lower bound for total income. Firstly, we do not include capital income due to the lack of data. Secondly, we do not consider the (partly tax-free) allowances for office related expenses as they are not part of the individual earnings.<sup>5</sup> Thirdly, we do not include additional incomes paid by the party for (vice-)chairmen of the parliamentary group as this information is not publicly available for all parties and MPs.<sup>6</sup> Finally, as noted above, we calculate outside earnings for the highest income category in a conservative way.

We combine the politicians' data with representative survey data for the electorate taken from the GSOEP (Wagner, Frick, and Schupp, 2007). Based on the GSOEP, the same socio-demographic variables are reconstructed for the electorate. Total gross earnings are calculated at the individual level by accumulating labor earnings, fringe benefits, pensions and replacement allowances. Education is based on the CASMIN classification, the sector of employment on the ISCO-88 classification. Furthermore, we employ information on occupational status. Citizens younger than 18 years and non-German individuals are excluded, since these individuals are not allowed to vote. In order to construct a suitable control group, we further restrict our sample to individuals working full-time.

Note, however, that we base our analysis on survey data. In many comparable data sets, high incomes can be excluded (due to non-response), top-coded,

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<sup>4</sup> As this choice may induce distortions, we experiment with several alternative upper bound levels. The results do not change qualitatively. In terms of quantitative effects, note that the chosen upper bound level presumably is a conservative assumption. Hence, if estimated effects are biased they will be underestimated (Becker, Peichl, and Rincke, 2009). We check the information on outside earnings with other data sources including newspaper reports and personal statements of MPs. Furthermore, misreporting has probably a high political cost – beside the legal threat to be punished. This became evident when Otto Schily, the former minister of home affairs, lost a lawsuit because he refused to publish his income as a lawyer.

<sup>5</sup> These allowances mainly cover expenses at the constituency (about 3,700 euros per month), staff costs (more than 14,000 euros) and travel costs.

<sup>6</sup> These can be quite substantial. A vice-chairman of the Social democratic parliamentary group (SPD), for instance, receives 3,451 euros per month as of 2011.

anonymized or less representative than other income ranges. To tackle this issue, the GSOEP includes a special high income sample to increase the representativeness of the upper tail of the income distribution, which has been validated based on administrative data (Frick, Goebel, Grabka, Groh-Samberg, and Wagner, 2007; Bach, Corneo, and Steiner, 2009). Another solution could be to directly use tax return data to analyze the top of the income distribution (Atkinson and Piketty, 2007; Roine and Waldenström, 2008; Roine, Vlachos, and Waldenström, 2009). However, for Germany this data does not include a sufficient number of socio-demographic characteristics to analyze the PWG (e.g. important information such as gender, education, occupation, tenure and working hours are missing).

## 4 Empirical Strategy and Results

### 4.1 Descriptive Representation

In a first step, the composition of the German parliament is analyzed regarding a potential misrepresentation of certain groups which are defined by several socio-demographic characteristics. Table 1 summarizes the distribution of characteristics of the German population and MPs.

Despite efforts to increase the number of women in professional leadership positions, male politicians are clearly over-represented in the Bundestag and outnumber the proportion of female MPs by more than 30 percentage points. MPs turn out to be slightly older and much better educated than the electorate. Furthermore, members of the Bundestag often exhibit an occupational background in the public sector. The theory of descriptive representation and numerous related empirical studies indicate that as a result of these incongruities, the interests of certain social groups may not receive the appropriate weight in the legislation process.

With respect to the (unconditional) PWG, we are especially interested in the comparability of both groups in terms of annual gross earnings. With a median of 19,400 euros, the center of the electorate's distribution is far below the center of the MPs' distribution which exhibits a median value of just over 86,000 euros. Less

than 3% of the electorate earn as much or more per year than the observed lowest earnings for the MPs, which is around 84,000 euros. We find that median earnings of full-time employees (33,300 euros) are significantly higher than the overall median, but still far below the MPs median.

Table 1: Socio-demographic characteristics of the electorate and the MPs (in %)

|   |                | Electorate | Full-time | Executive | MP      |
|---|----------------|------------|-----------|-----------|---------|
| <i>Gender</i>                               | Female         | 52.2       | 32.0      | 16.1      | 32.2    |
| <i>Age</i>                                  | 18 – 29        | 16.7       | 12.2      | 6.4       | 1.2     |
|   | 30 – 39        | 15.0       | 24.6      | 17.7      | 12.5    |
|   | 40 – 49        | 20.1       | 34.2      | 37.8      | 24.2    |
|   | 50 – 59        | 16.2       | 24.2      | 27.1      | 41.4    |
|   | 60 – 69        | 15.2       | 4.5       | 9.1       | 19.9    |
|   | $\geq 70$      | 16.8       | 0.3       | 1.8       | 0.8     |
| <i>Education</i>                            | Low-skilled    | 13.7       | 4.1       | 0.0       | 0.2     |
|   | Medium-skilled | 69.2       | 70.4      | 45.4      | 17.0    |
|   | High-skilled   | 17.1       | 25.5      | 54.6      | 82.8    |
| <i>Region</i>                               | West           | 77.4       | 79.4      | 85.5      | 78.0    |
| <i>Occupational status</i>                  | Non-working    | 44.2       | 0.0       | 0.0       | 0.0     |
|   | Part-time      | 21.2       | 0.0       | 0.0       | 0.0     |
|   | Full-time      | 34.6       | 100.0     | 100.0     | 100.0   |
| <i>Sector</i>                               | Employee       | 38.2       | 71.5      | 52.0      | 40.1    |
|   | Civil servant  | 8.1        | 16.6      | 34.6      | 53.4    |
|   | Self-employed  | 5.1        | 11.7      | 13.4      | 6.5     |
| <i>Annual gross earnings<br/>(in euros)</i> | Mean           | 23,677     | 38,836    | 64,237    | 105,698 |
|   | Median         | 19,440     | 33,300    | 52,283    | 86,108  |
|   | N              | 20,847     | 7,104     | 580       | 599     |

Combining these findings, the question arises whether the difference in earnings between the two populations can be explained by the differences in individual human capital or if there is an unexplained wage premium for politicians. Any income differential not accounted for by observable characteristics may constitute some form of economic rent or may be the result of unobserved heterogeneity due to, for example, individually different levels of productivity, talent or competitiveness.

## 4.2 Ordinary Least Squares

A Mincerian earnings equation is estimated using OLS regression, in which the logarithmized annual gross earnings of individual  $i \in \{1, \dots, n\}$  are defined as:

$$\ln(W_i) = \beta_0 + \beta_1 P_i + \beta \mathbf{X}_i + \mu_i, \quad (1)$$

with  $P_i$  a dummy variable of the value 1 if the individual is an MP and 0 otherwise. A positive and significant estimator of  $\beta_1$  would provide empirical evidence in favor of a wage premium for politicians. The vector  $\mathbf{X}_i$  includes control variables which have been identified in previous research to affect earnings such as gender, qualification dummies, tenure (squared), dummies for being married, number of children, party affiliation and executive position. Depending on the specification of the model, we also include interaction terms of certain characteristics with the politician dummy in order to test for heterogeneous effects. The error term is denoted by  $\mu_i$ .

**Baseline results.** The unconditional earnings gap between MPs and citizens working full-time is around 107%. This, however, might be due to differences in observable characteristics (see Tables A.1–A.3 in the Appendix for distributions of characteristics among MPs). Table 2 presents OLS results of the logarithmized annual gross individual earnings on the key variable *politician* and a number of covariates that are known to affect income. Model 1 is estimated on the full sample – defined as all individuals working full-time. We exclude non-working individuals and part-time employees as they do not represent the desired comparison group in order to identify the PWG.<sup>7</sup> The results indicate a strong and positive effect of the dummy variable *politician*, suggesting that MPs, *ceteris paribus*, earn 88% more than non-MP citizens.

The covariate coefficients have the expected signs: tenure and age have a positive but decreasing effect on earnings.<sup>8</sup> Education, which should also affect political

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<sup>7</sup> We also ran the regressions on a sample including part-timers as well as a part-time dummy. The estimated effects are almost identical to those of models 1 and 2.

<sup>8</sup> While the variable *tenure* measures specific human capital (for politicians measured as years in the Bundestag and for the electorate as years in the current firm), *age* captures the remaining effect of general human capital accumulation as a proxy variable of experience.

Table 2: OLS: Baseline results

| Sample              | Full-time sample     |                      |                      |                      | Executive sample     |                      |
|---------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|                     | Total                |                      | Remun. only          |                      | Total                | Remun. only          |
| MP income           | (1)                  | (2)                  | (3)                  | (4)                  | (5)                  | (6)                  |
| Politician          | 0.881***<br>(0.025)  | 0.613***<br>(0.031)  | 0.722***<br>(0.023)  | 0.450***<br>(0.029)  | 0.625***<br>(0.045)  | 0.459***<br>(0.041)  |
| Tenure              | 0.024***<br>(0.002)  | 0.024***<br>(0.002)  | 0.022***<br>(0.002)  | 0.022***<br>(0.002)  | 0.007*<br>(0.004)    | -0.002<br>(0.004)    |
| Tenure <sup>2</sup> | -0.004***<br>(0.001) | -0.004***<br>(0.001) | -0.004***<br>(0.001) | -0.004***<br>(0.001) | -0.001<br>(0.001)    | 0.001<br>(0.001)     |
| Age                 | 0.036***<br>(0.005)  | 0.037***<br>(0.005)  | 0.041***<br>(0.005)  | 0.042***<br>(0.005)  | 0.077***<br>(0.014)  | 0.090***<br>(0.013)  |
| Age <sup>2</sup>    | -0.003***<br>(0.001) | -0.004***<br>(0.001) | -0.004***<br>(0.001) | -0.004***<br>(0.001) | -0.007***<br>(0.001) | -0.008***<br>(0.001) |
| Medium-skilled      | 0.410***<br>(0.045)  | 0.395***<br>(0.045)  | 0.409***<br>(0.045)  | 0.393***<br>(0.045)  | -0.133***<br>(0.051) | -0.239***<br>(0.045) |
| High-skilled        | 0.860***<br>(0.046)  | 0.810***<br>(0.046)  | 0.857***<br>(0.046)  | 0.806***<br>(0.046)  | 0.133***<br>(0.039)  | 0.021<br>(0.033)     |
| Female              | -0.239***<br>(0.013) | -0.220***<br>(0.013) | -0.236***<br>(0.013) | -0.217***<br>(0.013) | -0.067**<br>(0.028)  | -0.044*<br>(0.023)   |
| Married             | 0.062***<br>(0.014)  | 0.058***<br>(0.013)  | 0.064***<br>(0.013)  | 0.060***<br>(0.013)  | 0.035<br>(0.033)     | 0.049*<br>(0.030)    |
| Children            | -0.011<br>(0.014)    | -0.016<br>(0.014)    | -0.013<br>(0.014)    | -0.018<br>(0.014)    | -0.016<br>(0.032)    | -0.024<br>(0.028)    |
| Christ. dem.        | 0.094***<br>(0.014)  | 0.083***<br>(0.014)  | 0.091***<br>(0.014)  | 0.081***<br>(0.014)  | 0.098***<br>(0.029)  | 0.085***<br>(0.025)  |
| Liberal             | 0.166***<br>(0.034)  | 0.147***<br>(0.033)  | 0.169***<br>(0.033)  | 0.150***<br>(0.033)  | 0.040<br>(0.054)     | 0.037<br>(0.050)     |
| East                | -0.332***<br>(0.013) | -0.319***<br>(0.013) | -0.328***<br>(0.013) | -0.315***<br>(0.013) | -0.170***<br>(0.033) | -0.139***<br>(0.030) |
| Self-employed       | -0.074***<br>(0.026) | -0.071***<br>(0.026) | -0.066**<br>(0.026)  | -0.064**<br>(0.026)  | 0.076<br>(0.057)     | 0.122**<br>(0.055)   |
| Civil servant       | -0.054***<br>(0.014) | -0.080***<br>(0.014) | -0.055***<br>(0.013) | -0.081***<br>(0.013) | -0.169***<br>(0.029) | -0.168***<br>(0.025) |
| Executive           |                      | 0.336***<br>(0.024)  |                      | 0.341***<br>(0.024)  |                      |                      |
| Constant            | 8.941***<br>(0.112)  | 8.928***<br>(0.111)  | 8.862***<br>(0.110)  | 8.848***<br>(0.109)  | 8.846***<br>(0.350)  | 8.751***<br>(0.333)  |
| Adjusted $R^2$      | 0.462                | 0.478                | 0.432                | 0.449                | 0.359                | 0.301                |
| Observations        | 7703                 | 7703                 | 7703                 | 7703                 | 1179                 | 1179                 |

*Note:* Robust standard errors in parentheses. Significance levels are 0.1 (\*), 0.05 (\*\*), and 0.01 (\*\*\*).

participation, has a positive effect on annual earnings. Compared to the low-skilled, high-skilled (medium-skilled) individuals have a positive income differential of 86% (41%). The female dummy reveals the well-known gender wage gap (Oaxaca, 1973) – in our case of around 24%, which is comparable to previous estimates for Germany (Kunze, 2005; Arulampalam, Booth, and Bryan, 2007). Being married slightly increases income, but having children decreases it. The variables concerning party affiliation confirm that members of those parties which are said to promote more business friendly policies – Christian democrats (CDU/CSU) and FDP – have higher levels of earnings (9% and 17% respectively). Living in East Germany reduces annual gross individual earnings by 33% on average. Finally, employees in the private sector have higher earnings than civil servants or self-employed.

In specification 2 we take into account that MPs by definition hold an executive position in terms of occupation.<sup>9</sup> They have personnel responsibility, which certainly distinguishes them from the average employee. Moreover, we expect the *executive* dummy to control for the fact members of the Bundestag – just as executives – have climbed the job ladder within their respective profession. It also captures the relatively high workload (and reduced leisure time) politicians and executives experience. Finally, the inclusion of a variable controlling for an executive position also enables us to address the common claim that politicians could earn much more if they held a similar position in the private sector. Our results suggest that there is no evidence for this claim. As expected, an executive position is associated with an earnings premium and the *politician* coefficient decreases but remains positive and significant, suggesting a wage premium of more than 60%. The covariate coefficients hardly change.

In specifications 3 and 4 we use a different income definition for politicians. Instead of estimating the models on total earnings, as was done in models 1 and 2, we assign MPs only the basic office remuneration – excluding outside earnings, payments for cabinet members, pensions and interim allowances. While the coefficients on the covariates are hardly affected, the ones on the *politicians'* dummies

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<sup>9</sup> In the GSOEP, citizens are defined as executives when their occupational position is one of the following: master craftsman, self-employed with 10 or more employees, manager or executive civil servant.

decrease by about 16 percentage points each, showing that outside earnings constitute a substantial share of the income premium. However, a PWG of 45% reveals that politicians still exhibit a substantial wage premium.

**Executive sample.** The previous results have shown that the executive dummy variable is of high explanatory power. Hence, in models 5 and 6 we restrict our control group to executives working full-time – in other words, individuals who are supposed to be more similar to MPs as far as workload and responsibility are concerned. Again we apply the two different earnings definitions for politicians. As expected the PWG declines in both specifications. When politicians’ total earnings are taken into account the PWG drops to 62% and for the basic office remuneration it shrinks to 46%. In absolute terms, this implies an annual income differential of around 47,700 and 35,000 euros respectively.<sup>10</sup> Moreover, we see that the returns to education change. When focusing on the executive subsample, the effect of being highly qualified on earnings becomes much smaller and completely disappears when looking at the basic office remuneration. The *medium-skilled* dummy becomes negative due to the presence of one unskilled individual among the executives who is an MP with higher earnings. The gender wage gap reduces to about 5%.

**Group-specific results.** We provide some evidence whether the overall PWG identified in Table 2 differs for certain socio-demographic groups. We therefore include various interaction terms of the *politician’s*-dummy and other characteristics. We estimate the different specifications on the executive sample and include all non-interacted covariates of model 5 of Table 2 as well. The results in Table 3 suggest that while we do not find returns to tenure, the MPs’ returns to education for medium-skilled politicians are much higher than those for high-skilled MPs (84% vs. 51%). Note that all MPs (with one exception) are at least medium-skilled.

The coefficient on *Pol. x Female* indicates that the overall gender pay gap is 24 percentage points lower for politicians. Recalling the gender wage gap of specification 5 in Table 2, it follows that women in politics enjoy an even higher wage

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<sup>10</sup> The average earnings of non-MPs in an executive position in our sample is just over 76,300 euros; whilst the average full-time employee earns approximately under 41,200 euros.

Table 3: OLS: Group-specific effects

|                     | (1)                 | (2)                  | (3)                 | (4)                 | (5)                  | (6)                  | (7)                  |
|---------------------|---------------------|----------------------|---------------------|---------------------|----------------------|----------------------|----------------------|
| Politician          | 0.547***<br>(0.061) | 0.695***<br>(0.059)  | 0.530***<br>(0.050) | 0.534***<br>(0.048) | 0.724***<br>(0.050)  | 0.590***<br>(0.051)  | 0.685***<br>(0.076)  |
| Pol. x Tenure       | 0.005<br>(0.004)    |                      |                     |                     |                      |                      | 0.009**<br>(0.004)   |
| Pol. x M-skill      |                     | 0.145***<br>(0.047)  |                     |                     |                      |                      | 0.124***<br>(0.047)  |
| Pol. x H-skill      |                     | -0.184***<br>(0.065) |                     |                     |                      |                      | -0.206***<br>(0.064) |
| Pol. x Female       |                     |                      | 0.243***<br>(0.063) |                     |                      |                      | 0.222***<br>(0.062)  |
| Pol. x East         |                     |                      |                     | 0.256***<br>(0.068) |                      |                      | 0.243***<br>(0.067)  |
| Pol. x Liberal      |                     |                      |                     |                     | -0.362***<br>(0.121) |                      | -0.264**<br>(0.118)  |
| Pol. x Christ. dem. |                     |                      |                     |                     | -0.279***<br>(0.059) |                      | -0.259***<br>(0.058) |
| Pol. x Self-empl.   |                     |                      |                     |                     |                      | -0.120***<br>(0.042) | -0.114***<br>(0.034) |
| Pol. x Civil serv.  |                     |                      |                     |                     |                      | 0.003<br>(0.031)     | -0.031<br>(0.029)    |
| Adjusted $R^2$      | 0.335               | 0.350                | 0.342               | 0.343               | 0.352                | 0.335                | 0.380                |
| Observations        | 1179                | 1179                 | 1179                | 1179                | 1179                 | 1179                 | 1179                 |

*Notes:* Regressions estimated on executive sample. MP income is defined as total earnings. In addition to the interaction terms, all covariates of model 2 in Table 2 are included in each specification. Robust standard errors in parentheses. Significance levels are 0.1 (\*), 0.05 (\*\*), and 0.01 (\*\*\*).

premium when being compared to the female electorate. This might help to explain why Kotakorpi and Poutvaara (2011) find that increasing office remuneration has stronger effects for female than for male candidates in Finland. Running separate regressions for males and females yields similar results, i.e. a significantly higher PWG for women. The same logic applies when looking at the East/West wage gap for politicians. The inclusion of an interaction term changes the sign of the income differential for politicians, i.e. MPs from East Germany benefit more from the wage premium compared to the Eastern electorate. Interestingly, as far as party affiliation is concerned, the results of specification 5 suggest that members of more leftist parties (Social democrats, Green Party, Left Party) have a substantively higher wage gap conditional on observable characteristics than members of right-wing parties.

More precisely, the earnings premium for liberal and Christian-democratic MPs decreases to 36% and 45% respectively. Furthermore, the PWG is lower for MPs who have been self-employed before becoming politician. In model 7 we control for all interactions terms simultaneously and results do not change considerably. To sum up, the PWG is higher for individuals who *ceteris paribus* have a lower earnings potential in the private labor market.

**Wage decomposition.** We conduct a Oaxaca-Blinder type wage decomposition to investigate to what extent the observed PWG can be explained by endowments (Oaxaca, 1973; Blinder, 1973). Estimating the Mincerian earnings regression separately for MPs and non-MPs allows difference in pay to be decomposed into a part which is explained by observable characteristics – the covariates – and an unexplained part. The decomposition reveals that observable endowments such as skill or age can only explain a negligible share of this difference for both samples and earnings concepts (results available upon request). As the majority of the PWG remains unexplained, we apply several matching techniques in Section 4.3 to further investigate the PWG.

### 4.3 Matching

There are two main advantages of matching over simple OLS regression. First, matching can be used to increase the comparability of the treated group – the politicians – and the control group – the electorate. In addition to restricting the sample as done in the OLS analysis, matching ensures that only the nearest neighbors in terms of characteristics or the probability of receiving “treatment”, i.e. in our case of becoming a politician, are used to estimate the PWG (Imbens, 2004; Imbens and Wooldridge, 2009). In that sense, matching is comparable to non-parametric regression methods such as kernel estimation since it allows identification without explicit assumptions regarding the (potentially non-linear) functional form of the association between dependent variables and explanatory factors. Second, the matching framework allows us to assess the relevance of potential unobserved factors influencing the PWG. In the context of our study, this might be especially important as unobserved

motivation or assertiveness could explain parts of the PWG found in Section 4.2.

We define a binary “treatment” indicator  $D_i \in \{0, 1\}$  that takes the value 1 if an individual is an MP and 0 otherwise. Again, the outcome variable  $W_i(D_i)$  is log annual gross earnings. We are interested in estimating the *average treatment effect on the treated* (ATT), which is defined as

$$\tau_{ATT} = E[W(1)|D = 1] - E[W(0)|D = 1] \quad (2)$$

with  $E[.]$  standing for expectation. The ATT is equal to the potential income differential if it was possible to draw an individual  $i$  randomly from the *sample of MPs only* and allow the simultaneous pursue a career as an MP and as a non-MP citizen in the regular labor market (see e.g. the survey by Caliendo and Kopeinig, 2008).

The choice of a profession in general and the career as a politician in particular is an individual one (Gregory and Borland, 1999; Belman and Heywood, 1989). Thus, it is critical to account for the factors that may have affected the choice of occupation when estimating its effect on the level of earnings. Matching on observable covariates  $X$  is an approach to solve this problem by finding “statistical twins” in the treatment as well as in the control group. As matching on numerous characteristics  $X$  might cause dimensionality problems, we follow standard practice and condition on the propensity score of being treated instead. Rosenbaum and Rubin (1983) show that propensity score matching equally ensures independence of treatment assignment from the potential outcomes. We estimate the probability of being a politician given  $X$ ,  $P(D = 1|X)$ , with a standard probit model. The covariates  $X$  describe the self-selection into the treatment process and ensure that ignorability of treatment is fulfilled. As a robustness check we also apply matching on covariates using a Mahalanobis distance metric.

**Rosenbaum bounds analysis.** We have so far assumed that the observable covariates  $X$  fully account for the self-selection of individuals into treatment and control group. However, if there are unobserved factors that simultaneously affect selection into treatment and the outcome, matching estimators are susceptible to a *hidden bias* (Caliendo and Kopeinig, 2008). In the case of politicians, unobserved

characteristics, such as motivation, competitiveness or networking skills, might determine selection into treatment, while simultaneously affecting earnings. To account for this potential bias, we follow Rosenbaum (2002) and examine whether the estimated treatment effects are robust to the presence of unobserved confounding variables.<sup>11</sup> Assuming that besides observed covariates  $X$  an unobserved confounder  $u$  exists, then the probability of receiving treatment for individual  $i$  is

$$\pi_i = P(X_i, u_i) = P(D_i = 1|X_i, u_i) = F(\beta X_i + \gamma u_i), \quad (3)$$

where  $\gamma$  is the effect of  $u_i$  on receiving the treatment (i.e. becoming an MP). Comparing the odds of a treated individual  $i$  to the odds of a matched individual  $j$  yields the odds-ratio  $\pi_i(1 - \pi_j)/\pi_j(1 - \pi_i)$ . Assuming that  $F$  is the logistic distribution, Rosenbaum (2002) derives the following bounds for the odds-ratio

$$\frac{1}{\exp(\gamma)} \leq \frac{\pi_i(1 - \pi_j)}{\pi_j(1 - \pi_i)} \leq \exp(\gamma) \equiv \Gamma, \quad (4)$$

where  $\Gamma$  measures the degree of departure from a situation without any hidden bias ( $\Gamma = 1$ ). The Wilcoxon sign rank test is applied to receive upper and lower bounds of the significance level of the estimated treatment effect, given a certain value of  $\Gamma$ . If this upper bound exceeds a certain threshold (5% in our case) for a given value of  $\Gamma$ , we cannot reject the null that a potential confounding factor  $u$ , which has the explanatory power of all observed covariates  $X$  times the value of  $\Gamma$ , renders the estimated effects insignificant. In other words, low values of  $\Gamma$  (slightly greater than 1) indicate that results are sensitive to unobserved confounders; extreme values of  $\Gamma$  (greater than 2.5) suggest that it is unlikely that confounding factors alter inference.

**Matching results.** We estimate the propensity score of being a politician using a simple probit model with all the socio-demographic variables available in our data, such as age, qualification, gender, children, marital status, occupational position (for politicians before becoming MPs) and region. A balancing test of the propen-

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<sup>11</sup> Another estimation technique to account for unobserved heterogeneity is the application of a fixed-effects regression (see Diermeier, Keane, and Merlo (2005) for an application to US Congress members). However, this would require a panel dataset of MPs, and we have only data for one legislative period. Moreover, there is no variation in the politicians' dummy for MPs.

sity score specification (Dehejia and Wahba, 2002) examines whether the estimated propensity score is an adequate measure to ensure that the distribution of  $X$  is equal among the control and treatment group at different values of the propensity score.<sup>12</sup>

As seen in Section 4.2 holding an executive position is an important factor when estimating the PWG. We therefore restrict our control group to executives working full-time. One of the main reasons for applying matching is that we want to make politicians and citizens as comparable as possible. In this regard, the reduction of the sample is not too costly since the explicit intention of the exercise is to consider only good matches. Hence, we check whether there are significant differences between treatment and control groups in the matched sample with regard to the means of observable characteristics. We also report the mean standardized bias, which reveals whether the matching was successful in balancing the covariates. We apply three different matching algorithms and use two different earnings definitions (see above).

Table 4 presents the results of several propensity score matching models with the logarithmized annual gross earnings as dependent variable. In specification 1 we employ a one-to-one nearest neighbor matching specification with replacement and a caliper.<sup>13</sup> The  $\widehat{ATT}$  for full earnings is highly significant and estimated at 0.397, which indicates that being a politician on average increases earnings by almost 40%.<sup>14</sup> Moreover, the effect is very robust to unobserved confounders as indicated by Rosenbaum's  $\Gamma$ . The t-statistics show that matching on the propensity score balances treatment and control group well, with no significant differences between the groups after matching. It reduces 80–100% of the differences in observable characteristics between politicians and the electorate. Also, a standardized bias of under 3 suggests that matching was successful (Caliendo and Kopeinig, 2008).

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<sup>12</sup> Following Dehejia and Wahba (2002) we sequentially add higher order terms of the covariates as well as interactions of those variables to the model until the balancing property is satisfied (Rubin and Thomas, 2000). Note that the interpretation of the coefficients of the propensity score estimation is not economically relevant. Neither is the purpose of propensity score estimation to predict the selection into treatment, but to balance the covariates. For completeness, estimation results of the probit estimation are presented in Table A.4 in the Appendix.

<sup>13</sup> Following Rosenbaum and Rubin (1985), a caliper of one quarter of the standard deviation of the estimated propensity score is chosen.

<sup>14</sup> For model 1 the standard error is calculated using the correction proposed by Abadie and Imbens (2006) for nearest neighbor with replacement on a continuous covariate. Note that we do not find significant differences between the ATT and the average treatment effect in any of the three models.

Table 4: Matching results: Executive sample

|                                  | (1)              | (2)                 | (3)                  |
|----------------------------------|------------------|---------------------|----------------------|
| Matching Algorithm               | Nearest Neighbor | Epanechnikov kernel | Mahalanobis distance |
| Treated observations             | 598              | 598                 | 575                  |
| Control observations             | 580              | 580                 | 549                  |
| Full earnings                    |                  |                     |                      |
| ATT                              | 0.397 (0.053)    | 0.432 (0.048)       | 0.441 (0.037)        |
| $\Gamma$                         | 3.4              | -                   | 5.0                  |
| Basic office remuneration        |                  |                     |                      |
| ATT                              | 0.223 (0.050)    | 0.258 (0.051)       | 0.263 (0.036)        |
| $\Gamma$                         | 2.0              | -                   | 3.0                  |
| t-statistics / % bias reduction: |                  |                     |                      |
| Age                              | 0.68 / 85.9      | 0.68 / 85.6         | 1.13 / 75.7          |
| Female                           | 0.25 / 96.2      | -0.54 / 91.7        | 0.26 / 96.0          |
| Medium-skilled                   | 0.78 / 90.5      | 0.56 / 93.2         | -0.08 / 99.0         |
| High-skilled                     | -0.78 / 90.4     | -0.56 / 93.1        | 0.08 / 99.0          |
| Children                         | 1.20 / 74.6      | 0.61 / 87.2         | -0.19 / 96.0         |
| Married                          | 0.31 / 89.5      | -0.53 / 82.6        | -0.13 / 95.6         |
| Civil servant                    | 0.41 / 92.2      | 0.02 / 99.7         | 0.06 / 98.8          |
| Self-employed                    | 0.00 / 100.0     | 0.32 / 93.7         | -0.00 / 100.0        |
| East                             | 0.49 / 79.9      | -0.68 / 71.6        | 0.90 / 64.2          |
| Standardized Bias                | 2.85             | 2.78                | 2.24                 |

*Note:* Estimates are based on “psmatch2” by Leuven and Sianesi (2010) and “rbounds” by Gangl (2004). One-to-one nearest neighbor matching conducted with replacement and a caliper of  $0.25 \cdot \sigma_{prop.score}$ . Bandwidth of Epanechnikov kernel is 0.06. Common support imposed for Mahalanobis distance matching. ATT refers to average treatment effect on the treated. Standard errors of ATT (shown in parentheses) are corrected following Abadie and Imbens (2006) for model 1, and bootstrapped for models 2 and 3 using 400 replications.  $\Gamma$  denotes the maximum factor of influence (in terms of the explanatory power of the observables) a potential unobserved confounder can have without rendering the PWG estimate insignificant (based on a 5% significance level). t-statistics with  $H_0$  “no significant differences in mean characteristic between treated and control group”, % bias reduction corresponds to reduced differences in observables between control and treatment due to matching.

In specification 2 we use an Epanechnikov kernel matching estimator. This estimator makes use of all observations and weighs them according to their distance in the propensity score. Thus, we trade more efficiency for a potentially higher bias of our estimates as we do not restrict the analysis to the best matches. In fact, treatment effects hardly change in size and remain highly significant.<sup>15</sup> Again, all covariates of the model are balanced and the bias reduction is similar to model 1.

In model 3 we use matching on covariates based on the Mahalanobis distance metric to estimate treatment effects.<sup>16</sup> As an alternative to caliper matching, we introduce common support to guarantee that only good matches are taken into consideration. As a consequence, the number of individuals used for matching is slightly reduced, increasing the variance of the estimates. Reassuringly, the  $\widehat{ATT}$  does not change much and remains highly significant.

The estimated effects shrink considerably, when we make use of a different income definition. With basic office remuneration – excluding outside earnings, payments for cabinet members, pensions and interim allowances – the  $\widehat{ATT}$  drops by about 40%, underpinning once again the importance of outside earnings when looking at the PWG. In spite of this decline, the treatment effects are still significantly different from zero and have a substantial magnitude. For instance, a PWG of 25.8%, as estimated for model 2, implies an average annual wage premium of about 20,000 euros compared to 33,000 euros for the full earnings specification.

## 5 Discussion of the Results

**Robustness.** The existence of a sizeable PWG is robust to the estimation technique (OLS vs. matching), various specifications, control groups, earnings definitions and unobserved heterogeneity. As far as matching is concerned, we obtain similar results when using a logit instead of a probit model to estimate the propensity score. Moreover, reducing the complexity of the binary dependent variable model by ex-

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<sup>15</sup> For models 2 and 3 we bootstrap standard errors using 400 replications. Note that a Rosenbaum bound analysis cannot be performed when a kernel matching estimator is employed.

<sup>16</sup> We include all covariates shown in the bottom part of Table 4 and the propensity score to calculate the Mahalanobis distance.

cluding higher-order and interactions terms does not affect the results. Neither does the introduction of common support – instead of a caliper – change our findings. Moreover, the matching results are robust with respect to different kernels.

We additionally check the robustness of our estimates by changing the definition of the control group.<sup>17</sup> First, we exclude public sector employees from our executive sample, since they have fixed wage trajectories and no performance based paying scheme. The PWG decreases to 14–40% (12,000–34,000 euros p.a.) for full earnings. Further narrowing the executive definition to “managers” only reduces the PWG to 18–30% (18,000–32,000 euros p.a.). In both cases, the PWG remains sizeable and significant ruling out that the private-public sector wage gap or the choice of the control group drives the average PWG for full earnings. Results for basic office remuneration vary between 0 and 25%. However, the control group of managers is representative for the total population, whereas top managers of large, multinational enterprises are very rare. In fact, there are only two individuals in our data with annual labor earnings exceeding one million euros. Hence, the PWG we measure differs from the publicly perceived wage gap between politicians and top executives. Defining the control group as the upper 5% of the earnings distribution yields a PWG of 10–16% for full MP earnings (corresponding to 10,000–16,000 euros p.a.) while it vanishes and turns negative when considering office remuneration only.

**Size of the effects.** Besides being robust, the estimated PWG is highly significant and substantial in size. Nevertheless, we argue that our findings are lower bound estimates for two reasons. First, the data on earnings of MPs are close to a lower bound themselves, since we can only rely on information on outside earnings that are reported in broader income classes. As we assume a conservative upper bound of outside earnings, our estimated effects will rather be biased downwards (Becker, Peichl, and Rincke, 2009). Second, one can distinguish two main types of MPs: *career politicians* vs. *political careers* (Mattozzi and Merlo, 2008). While politicians of the first type typically remain in office until retirement, representatives pursuing a political career resign from office before retirement age and change to the private

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<sup>17</sup> See Table A.5 for an overview of PWG estimates for different control groups.

sector (again). It is plausible that having been in office as MP for a couple of years creates more attractive job opportunities, *ceteris paribus*. It might be exactly this mechanism that leads to the widely held belief that politicians earn more in the private sector. For instance, a career as an MP brings along many occasions to socialize with potential employers.<sup>18</sup> This can be interpreted as a non-monetary benefit of political office, which can translate into a monetary one after leaving the political arena. Hence, the true “lifetime PWG” would be higher.

An argument in favor of a positive PWG could be additional non-monetary costs. MPs have to work their way up for many years before becoming career politicians which requires effort. In addition, the rather low reputation of politicians in general (see above), the loss of privacy or job-insecurity because of elections reduce the attractiveness of the job. However, one has to take into account that there are also non-monetary benefits of being in office, such as satisfying the desire for power or having the possibility to implement policies in accordance with one’s convictions. Both non-monetary costs and benefits are not measurable and hence not further investigated here – implicitly assuming that they balance each other.

Our results are based on gross earnings before taxes which is the common income definition in the labor economics literature on wage gaps. The question arises whether the PWG would turn out to be different for disposable income after taxes. Unfortunately, we do not observe all the relevant information for MPs in order to calculate tax liabilities. Therefore, we can only speculate that the PWG should not change much due to two opposing effects. On the one hand, MPs *ceteris paribus* pay higher taxes because of progressive income taxation in Germany. On the other hand, it is well-known that German MPs donate larger amounts to their parties which are deductible from the income tax liability. Hence, the sign of the net-effect is unclear.

**Campaigning costs.** Even after accounting for observed as well as unobserved characteristics, we still find a substantial earnings premium for politicians. However, as laid out in Section 2, the citizen candidate framework provides a justification for

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<sup>18</sup> In addition, there is a relatively recent literature on the returns to being a politician (Eggers and Hainmueller, 2009; Querubin and Snyder, 2009) which is more concerned with lifetime income.

a PWG. Individuals of high ability, and hence with above average earnings potential in the private sector, will only decide to run for office when the remuneration compensates for campaigning costs. Hence, the detected wage premium could be justifiable if the amount of politicians' surplus earnings equaled their campaigning costs. Figuring out whether this holds true in the case of Germany would require detailed information on individual campaigning activities and their costs in terms of both monetary costs and time devoted to the campaign.<sup>19</sup> Unfortunately, this information is not available for German MPs. Nevertheless, in a back of the envelope calculation, we make an attempt to approximate the costs of campaigning and compare them to our findings for the PWG. There is suggestive evidence that *monetary* campaigning costs for German MPs total 30,000 to 65,000 euros (for a four-year legislative term).<sup>20</sup> Hence, only part of the detected earnings premium can be justified by monetary campaigning costs, since the PWG in absolute terms is estimated to lie between 100,000 and 190,000 euros (over a period of four years), depending on the specification.

**Normative implications.** One can think of several potential explanations for the existence of a PWG exceeding the threshold of campaigning costs: First, the PWG can be thought of as a compensation for unobserved characteristics, since elected politicians can be assumed to be more talented or more motivated. However, the Rosenbaum bounds analysis does not support this view as the unobserved factor (for the executive sample) must be 3 to 5 times larger than the effects of all observables together – which is unlikely given our set of covariates. A second explanation emphasizes the politicians' above average workload. Many German MPs usually state to work 50–70 hours a week (exact information on working hours of MPs is

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<sup>19</sup> For effects of campaign spending on election outcomes see Gerber (1998) and Evans (2007).

<sup>20</sup> In order to calculate these numbers, we divide the total campaigning expenses of the five parties represented in the Bundestag in 2005 (61 million euros at the federal level and 125 million euros in total) by the number of candidates (1,912). We also refer to information on campaigning costs voluntarily disclosed by two MPs on their personal websites, which reveal similar magnitudes (Martin Dörmann: <http://www.martin-doermann.de/live/wp-content/uploads/2008/02/glaeserne-taschen.pdf> (01–14–2011) and Florian Pronold: <http://www.glaeserner-abgeordneter.de/infotour/wahlkampfausgaben> (01–14–2011)). On the individual level, these costs include de facto mandatory donations of MPs to their respective parties (“*Mandatsträgerbeiträge*”).

not available) and one could argue that the extra pay for politicians compensates for less leisure time. However, compared to the average working hours of a full-time executive which is 55 hours a week (the top 10% on average work 74 hours), one can conclude that the high workload is not exceptional given the MPs' position. Hence, the PWG we find for the executive sample remains unchallenged by this claim. Finally, politicians might extract rents from being in office: MPs in Germany and several other countries decide themselves on the level of office remuneration.

## 6 Conclusions

In this paper we show the existence of a PWG for German MPs after conditioning on relevant wage determinants. Both OLS and matching analyses reveal a significant and substantial wage premium for MPs, which varies between 70–90% for the full sample and between 40–60% (corresponding to 30,000–50,000 euros per year) when restricting the control group to citizens in executive positions with a similar workload. Hence, we show that the claim that politicians would earn significantly more when working in the private sector is not confirmed by our data – in fact, the opposite is true. The income premium is reduced to 20–45% (corresponding to 17,000–35,000 euros per year) when focusing on the basic office remuneration, i.e. excluding politicians' outside earnings, but remains both economically and statistically significant. In addition, the Rosenbaum bounds analysis reveals that the significance of the wage gap is unlikely to be caused by unobserved factors.

We further show that the PWG exceeds reasonable estimates of campaigning costs and cannot be justified by extraordinary workload of MPs. If the general perception of the electorate is that politicians do not meet their job's above average responsibility, the above average pay might consequently pose a threat not only to the legitimacy of the politicians, but also to the acceptance of democracy in general. This problem might even be aggravated in the light of theoretical and empirical studies showing that higher earnings need not necessarily lead to better politicians (Poutvaara and Takalo, 2007; Kotakorpi and Poutvaara, 2011). As far as our results are concerned, we cannot refute the claim that (part) of the PWG can be seen as

rent extraction which hurts voters. This would call for a reform of the German system of remuneration of MPs – especially with respect to the legal framework of outside earnings, which account for 30–40% of the PWG.<sup>21</sup>

Since our analysis focuses on Germany, the question arises whether the main findings are likely to apply to other countries as well. With its socio-economic and demographic structure, Germany can be seen as a typical Western European democracy. However, the institutional details and regulations on outside earnings are rather special. Therefore, more (comparative) country studies are required to complete the picture.

## References

- ABADIE, A., AND G. W. IMBENS (2006): “Large Sample Properties of Matching Estimators for Average Treatment Effects,” *Econometrica*, 74(1), 235–267.
- ALLENSBACHER ARCHIV (2008): “IfD-Umfragen 10015,” Institut für Demoskopie Allensbach.
- ARULAMPALAM, W., A. L. BOOTH, AND M. L. BRYAN (2007): “Is there a Glass Ceiling over Europe? Exploring the Gender Pay Gap across the Wage Distribution,” *Industrial and Labor Relations Review*, 60(2), 163–186.
- ATKINSON, A. B., AND T. PIKETTY (2007): *Top Incomes over the Twentieth Century*. Oxford University Press, Oxford.
- BACH, S., G. CORNEO, AND V. STEINER (2009): “From Bottom to Top: The Entire Income Distribution in Germany, 1992–2003,” *Review of Income and Wealth*, 55(2), 303–330.
- BECKER, J., A. PEICHL, AND J. RINCKE (2009): “Politicians’ Outside Earnings and Electoral Competition,” *Public Choice*, 140(3–4), 379–394.
- BELMAN, D., AND J. S. HEYWOOD (1989): “Government Wage Differentials: A Sample Selection Approach,” *Applied Economics*, 21(4), 427–439.
- BENDER, K. A. (1998): “The Central Government-Private Wage Differential,” *Journal of Economic Surveys*, 12(2), 177–220.
- BESLEY, T. (2004): “Joseph Schumpeter Lecture: Paying Politicians: Theory and Evidence,” *Journal of the European Economic Association*, 2(2–3), 193–215.

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<sup>21</sup> Note that in contrast to the US, where outside income for MPs is limited to 15% of the pay for Level II of the Executive Schedule, outside earnings in Germany are not limited. Furthermore, Gagliarducci, Nannicini, and Naticchioni (2010) find a positive association between outside earnings and absenteeism. In addition, politicians might be influenced or even become financially dependent on certain lobby groups because of outside income (Couch, Atkinson, and Shugart II, 1992).

- BESLEY, T., AND S. COATE (1997): “An Economic Model of Representative Democracy,” *Quarterly Journal of Economics*, 112(1), 85–114.
- BLANK, R. M. (1993): “Public Sector Growth and Labor Market Flexibility: The United States vs. The United Kingdom,” *National Bureau of Economic Research Working Paper No. 4339*.
- BLINDER, A. S. (1973): “Wage Discrimination: Reduced Form and Structural Estimates,” *Journal of Human Resources*, 8(4), 436–455.
- BOBO, L., AND F. D. GILLIAM JR. (1990): “Race, Sociopolitical Participation, and Black Empowerment,” *American Political Science Review*, 84(2), 377–393.
- BRAENDLE, T., AND A. STUTZER (2010): “Public Servants in Parliament: Theory and Evidence on its Determinants in Germany,” *Public Choice*, 145(1–2), 223–252.
- BUNDESMINISTERGESETZ (2008): “Gesetz über die Rechtsverhältnisse der Mitglieder der Bundesregierung,” Bundesgesetzblatt I, S. 2018.
- BUNDESTAG (2009): “Entwurf eines Siebenundzwanzigsten Gesetzes zur Änderung des Abgeordnetengesetzes,” Deutscher Bundestag, Drucksache 16/6924, Heeneman, Berlin.
- (2010): “Verhaltensregeln für Mitglieder des Deutschen Bundestages,” Deutscher Bundestag, Geschäftsordnung des Deutschen Bundestages und Geschäftsordnung des Vermittlungsausschusses.
- (2011): “Hinweise zur Veröffentlichung der Angaben gemäß Verhaltensregeln im Amtlichen Handbuch und auf den Internetseiten des Deutschen Bundestages,” Deutscher Bundestag, <http://www.bundestag.de/bundestag/abgeordnete17/nebentaetigkeit/hinweise17.html>.
- CADIGAN, J. (2005): “The Citizen Candidate Model: An Experimental Analysis,” *Public Choice*, 123(1–2), 197–216.
- CALIENDO, M., AND S. KOPEINIG (2008): “Some Practical Guidance for the Implementation of Propensity Score Matching,” *Journal of Economic Surveys*, 22(1), 31–72.
- CASELLI, F., AND M. MORELLI (2004): “Bad Politicians,” *Journal of Public Economics*, 88(3–4), 759–782.
- COUCH, J. F., K. E. ATKINSON, AND W. F. SHUGART II (1992): “Ethical Laws and the Outside Earnings of Politicians: The Case of Alabama’s “legislator-educators”,” *Public Choice*, 73(2), 135–145.
- DE PAOLA, M., AND V. SCOPPA (2011): “Political Competition and Politician Quality: Evidence from Italian Municipalities,” *Public Choice*, forthcoming.
- DEHEJIA, R. H., AND S. WAHBA (2002): “Propensity Score-Matching Methods for Nonexperimental Causal Studies,” *Review of Economics and Statistics*, 84(1), 151–161.

- DIERMEIER, D., M. KEANE, AND A. MERLO (2005): “A Political Economy Model of Congressional Careers,” *American Economic Review*, 95(1), 347–373.
- DOWNES, A. (1957): *An Economic Theory of Democracy*. Harper and Brothers, New York.
- EGGERS, A. C., AND J. HAINMUELLER (2009): “MPs for Sale? Estimating Returns to Office in Postwar British Politics,” *American Political Science Review*, 103(4), 513–533.
- EHRENBERG, R. G., AND J. L. SCHWARZ (1987): “Public Sector Labor Markets,” in *Handbook of Labor Economics, Volume 2*, ed. by O. Oshenfelter, and D. Card. North-Holland, Amsterdam.
- EUROPEAN SOCIAL SURVEY (2007): *Exploring Public Attitudes, Informing Public Policy: Selected Findings from the First Three Rounds*.
- EVANS, T. (2007): “An Empirical Test of Why Incumbents Adopt Campaign Spending Limits,” *Public Choice*, 132(3), 437–456.
- FERRAZ, C., AND F. FINAN (2009): “Motivating Politicians: The Impact of Monetary Incentives on Quality and Performance,” *National Bureau of Economic Research Working paper No. 14906*.
- FREEMAN, R. B. (1986): “Unionism Comes to the Public Sector,” *Journal of Economic Literature*, 24(1), 41–86.
- FRICK, J. R., J. GOEBEL, M. M. GRABKA, O. GROH-SAMBERG, AND G. G. WAGNER (2007): “Zur Erfassung von Einkommen und Vermögen in Haushaltssurveys: Hocheinkommensstichprobe und Vermögensbilanz im SOEP,” SOEPpaper on Multidisciplinary Panel Data Research No. 19, German Institute for Economic Research (DIW) Berlin.
- GAGLIARDUCCI, S., AND T. NANNICINI (2009): “Do Better Paid Politicians Perform Better? Disentangling Incentives from Selection,” *IZA Discussion Paper No. 4400*.
- GAGLIARDUCCI, S., T. NANNICINI, AND P. NATICCHIONI (2010): “Moonlighting Politicians,” *Journal of Public Economics*, 94(9–10), 688–699.
- GANGL, M. (2004): “RBOUNDS: Stata Module to Perform Rosenbaum Sensitivity Analysis for Average Treatment Effects on the Treated,” Statistical Software Components, Boston College Department of Economics.
- GERBER, A. (1998): “Estimating the Effect of Campaign Spending on Senate Election Outcomes Using Instrumental Variables,” *American Political Science Review*, 92(2), 401–411.
- GERSBACH, H. (2009): “Competition of Politicians for Wages and Office,” *Social Choice and Welfare*, 33(1), 51–71.

- GILENS, M. (2005): “Inequality and Democratic Responsiveness,” *Public Opinion Quarterly*, 69(5), 778–796.
- GORODNICHENKO, Y., AND K. S. PETER (2007): “Public Sector Pay and Corruption: Measuring Bribery from Micro Data,” *Journal of Public Economics*, 91(5-6), 963–991.
- GREGORY, R. G., AND J. BORLAND (1999): “Recent Developments in Public Labor Markets,” in *Handbook of Labor Economics, Volume 3c*, ed. by O. Oshenfelter, and D. Card. North-Holland, Amsterdam.
- HARTOG, J., AND H. OOSTERBEEK (1993): “Public and private sector wages in the Netherlands,” *European Economic Review*, 37(1), 97–114.
- HAY, C. (2007): *Why We Hate Politics*. Polity Press, Cambridge.
- IMBENS, G. W. (2004): “Nonparametric Estimation of Average Treatment Effects Under Exogeneity: A Review,” *Review of Economics and Statistics*, 86(1), 4–29.
- IMBENS, G. W., AND J. M. WOOLDRIDGE (2009): “Recent Developments in the Econometrics of Program Evaluation,” *Journal of Economic Literature*, 47(1), 5–86.
- KOTAKORPI, K., AND P. POUTVAARA (2011): “Pay for Politicians and Candidate Selection: An Empirical Analysis,” *Journal of Public Economics*, forthcoming.
- KUNZE, A. (2005): “The Evolution of the Gender Wage Gap,” *Labour Economics*, 12(1), 73–97.
- LEUVEN, E., AND B. SIANESI (2010): “PSMATCH2: Stata Module to Perform Full Mahalanobis and Propensity Score Matching, Common Support Graphing, and Covariate Imbalance Testing,” *Statistical Software Components*, Boston College Department of Economics.
- LINEBERRY, R. L. (1978): “Reform, Representation, and Policy,” *Social Science Quarterly*, 59(1), 173–177.
- MATTOZZI, A., AND A. M. MERLO (2008): “Political Careers or Career Politicians?,” *Journal of Public Economics*, 92(3–4), 597–608.
- MEIER, K. J., AND R. E. ENGLAND (1984): “Black Representation and Educational Policy: Are They Related?,” *American Political Science Review*, 78(2), 392–403.
- MELLY, B. (2005): “Private Sector Wage Differentials in Germany: Evidence from Quantile Regression,” *Empirical Economics*, 30(2), 505–520.
- MESSNER, M., AND M. K. POLBORN (2004): “Paying Politicians,” *Journal of Public Economics*, 88(12), 2423–2445.
- OAXACA, R. (1973): “Male-Female Wage Differentials in Urban Labor Markets,” *International Economic Review*, 14(3), 693–709.

- OSBORNE, M. J., AND A. SLIVINSKI (1996): “A Model of Political Competition with Citizen-Candidates,” *Quarterly Journal of Economics*, 111(1), 65–96.
- PEDERSON, P. J., J. B. SCHMIDT-SØRENSEN, N. SMITH, AND N. WESTERGÅRD-NIELSEN (1990): “Wage Differentials Between the Public and Private Sectors,” *Journal of Public Economics*, 41(1), 125–145.
- PITKIN, H. F. (1972): *The Concept of Representation*. University of California Press, Berkeley.
- POUTVAARA, P., AND T. TAKALO (2007): “Candidate Quality,” *International Tax and Public Finance*, 14(1), 7–27.
- QUERUBIN, P., AND J. M. SNYDER (2009): “The Returns to US Congressional Seats in the Mid-19th Century,” in *The Political Economy of Democracy*, ed. by E. Aragonés, C. Bevia, H. Llavador, and N. Schofield. BBVA, Bilbao.
- ROINE, J., J. VLACHOS, AND D. WALDENSTRÖM (2009): “The Long-Run Determinants of Inequality: What can we learn from Top Income Data?,” *Journal of Public Economics*, 93(7–8), 974–988.
- ROINE, J., AND D. WALDENSTRÖM (2008): “The Evolution of Top Incomes on an Egalitarian Society: Sweden, 1903–2004,” *Journal of Public Economics*, 92(1–2), 366–387.
- ROSENBAUM, P. R. (2002): *Observational Studies*. Springer, New York, 2. edn.
- ROSENBAUM, P. R., AND D. B. RUBIN (1983): “The Central Role of the Propensity Score in Observational Studies for Causal Effects,” *Biometrika*, 70(1), 41–55.
- (1985): “Constructing a Control Group Using Multivariate Matched Sampling Methods That Incorporate the Propensity Score,” *American Statistician*, 39(1), 33–38.
- RUBIN, D. B., AND N. THOMAS (2000): “Combining Propensity Score Matching with Additional Adjustments for Prognostic Covariates,” *Journal of the American Statistical Association*, 95(450), 573–585.
- SOLT, F. (2008): “Economic Inequality and Democratic Political Engagement,” *American Journal of Political Science*, 52(1), 48–60.
- WAGNER, G. G., J. R. FRICK, AND J. SCHUPP (2007): “The German Socio-economic Panel Study (SOEP): Scope, Evolution and Enhancements,” *Schmollers Jahrbuch*, 127(1), 139–169.

# A Appendix

Table A.1: Demographic and political characteristics of MPs by party affiliation

|                    | Age (years) | Tenure (years) | Female (%) | East (%) | Direct (%) |
|--------------------|-------------|----------------|------------|----------|------------|
| Christian democrat | 51.8        | 9.1            | 21.7       | 16       | 66.4       |
| Social democrat    | 52.4        | 8.7            | 35.5       | 21       | 65.0       |
| Green Party        | 48.6        | 5.5            | 58.7       | 20       | 2.2        |
| Liberal Party      | 49.9        | 6.5            | 24.6       | 18       | 0.0        |
| Left Party         | 50.6        | 3.9            | 49.1       | 57       | 5.7        |
| None               | 49.5        | 2.5            | 0.0        | 50       | 50         |
| Total              | 51.5        | 7.9            | 32.2       | 22       | 48.7       |

Table A.2: Occupational and income characteristics of MPs by party affiliation

|                    | Employee (%) | Civil servant (%) | Self-employed (%) | Earnings (euros) |
|--------------------|--------------|-------------------|-------------------|------------------|
| Christian democrat | 51.6         | 43.8              | 4.6               | 109,274          |
| Social democrat    | 25.9         | 71.4              | 2.7               | 108,387          |
| Green Party        | 39.1         | 50.0              | 10.9              | 96,020           |
| Liberal Party      | 55.7         | 24.6              | 19.7              | 102,776          |
| Left Party         | 34.0         | 54.7              | 11.3              | 91,925           |
| None               | 50.0         | 50.0              | 0.0               | 98,608           |
| Total              | 40.1         | 53.4              | 6.5               | 105,698          |

Table A.3: Level of education of MPs by party affiliation (in %)

|                    | Low | Medium | High |
|--------------------|-----|--------|------|
| Christian democrat | 0.0 | 17.1   | 82.9 |
| Social democrat    | 0.0 | 20.5   | 79.5 |
| Green Party        | 0.0 | 13.0   | 87.0 |
| Liberal Party      | 0.0 | 4.9    | 95.1 |
| Left Party         | 1.9 | 18.9   | 79.2 |
| None               | 0.0 | 50.0   | 50.0 |
| Total              | 0.2 | 17.0   | 82.8 |

Table A.4: Propensity score estimation

|                       |           |         |
|-----------------------|-----------|---------|
| Age                   | 0.193***  | (0.010) |
| High-skilled          | 2.315***  | (0.516) |
| Children              | -0.635*** | (0.143) |
| Female                | 0.587**   | (0.274) |
| East                  | 0.767***  | (0.242) |
| Civil servant         | -0.198**  | (0.097) |
| Self-employed         | -0.790*   | (0.420) |
| Married               | 0.016     | (0.142) |
| Age x H-skill         | -0.175*** | (0.011) |
| Age x M-skill         | -0.150    | (0.000) |
| H-skill x Female      | -0.310    | (0.248) |
| H-skill x Self-empl.  | 0.276     | (0.404) |
| M-skill x Children    | -0.013    | (0.263) |
| M-skill x Married     | -0.059    | (0.262) |
| M-skill x Civil serv. | 1.584***  | (0.234) |
| Children x Female     | 0.657***  | (0.222) |
| Children x East       | -0.601**  | (0.267) |
| Children x Self-empl. | -0.165    | (0.329) |
| Female x Married      | -0.472**  | (0.225) |
| Female x Self-emp.    | 0.712**   | (0.337) |
| Constant              | -2.609*** | (0.457) |
| $\chi^2$              | 274.650   |         |
| Observations          | 1179      |         |

*Notes:* Probit estimated on executive sample. Standard errors in parentheses. Significance levels are 0.1 (\*), 0.05 (\*\*), and 0.01 (\*\*\*).

Table A.5: PWG for different control groups

| Control group    | Observations | Full earnings | Remuneration Only |
|------------------|--------------|---------------|-------------------|
| OLS              |              |               |                   |
| Executives       | 1,179        | 0.625 (0.045) | 0.459 (0.041)     |
| No public sector | 636          | 0.389 (0.059) | 0.247 (0.055)     |
| Managers only    | 806          | 0.324 (0.058) | 0.145 (0.053)     |
| Top 5% earnings  | 1,577        | 0.161 (0.031) | -0.002 (0.024)    |
| Matching         |              |               |                   |
| Executives       | 1,178        | 0.432 (0.048) | 0.258 (0.051)     |
| No public sector | 636          | 0.141 (0.081) | -0.017 (0.079)    |
| Managers only    | 805          | 0.185 (0.082) | 0.011 (0.074)     |
| Top 5% earnings  | 1,593        | 0.101 (0.020) | -0.072 (0.017)    |

*Note:* OLS estimates are based on specifications 5 and 6 of Table 2, matching estimates on model 2 in Table 4. Standard errors in parentheses.