

# Labor Supply of Politicians

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September 2014

## Abstract

Using data on Members of the European Parliament (MEPs), we examine the impact of salaries on the composition and the behavior of legislators. Employing a differences-in-differences approach, we exploit the introduction of a law that equalized MEPs' salaries which had previously differed by as much as a factor of ten. Increasing salaries raises the fraction of MEPs who run for reelection but decreases the quality of elected MEPs (proxied by college quality). Salary has no discernible impact on effort or legislative output. Higher salaries induce more political competition.

*JEL classification:* D72, D73

*Keywords:* politicians' salaries, corruption, shirking, reelection, European Parliament

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\*We thank the editor, referees, Matthew Gentzkow, Canice Prendergast, Jesse Shapiro, and seminar participants for helpful comments. Jennifer Kwok provided excellent research assistance. This work is supported by the William Ladany Faculty Research Fund at the University of Chicago Booth School of Business.

# 1 Introduction

The impact of salary on selection and behavior of politicians is a longstanding question in political economy. Theoretical analyses of this question provide inconclusive answers. Caselli and Morelli (2004), for example, construct a model where an increased salary improves the quality of elected officials. Besley (2004), however, identifies a channel that leads to the opposite prediction. Theoretical analyses also give limited guidance on the likely effects of salary on politicians' effort.

In this paper, we empirically analyze the impact of salaries on the composition and the behavior of Members of the European Parliament (MEPs). We construct a measure of each MEP's legislative output based on standard proxies, such as the authoring of reports, presenting motions for resolution, and providing written opinions on legislative proposals.<sup>1</sup> We show that an MEP's human capital (measured by her tenure and the ranking of her undergraduate institution) and effort (measured by her participation in voting) are key inputs into legislative productivity. We then examine how salaries impact these inputs and the consequent outcomes.

Our source of identification is a recent change in the way that MEPs' salaries are determined. The European Parliament is the directly elected legislative chamber of the European Union. It is composed of 736 MEPs from 27 constituent countries. MEPs are elected for 5-year terms by voters from their home countries. Prior to 2009, each MEP received the same salary as the members of the lower house of her home country national parliament. This induced great variation in MEPs' remuneration. For example, in 2004, the highest paid MEPs (those from Italy) were paid an annual salary of €144,084 while the lowest paid ones (those from Hungary) earned €10,080 per year. Even MEPs from similar countries received very different salaries. For example, Spanish MEPs were paid €38,396 per year, roughly 75% less than Italian MEPs, despite the countries' near-identical levels of GDP per capita. In 2005, the two legislative chambers of the European Union agreed on a salary harmonization: as of the first day of the parliamentary term starting in 2009, almost<sup>2</sup> all MEPs would receive an identical salary of roughly €90,000. For some MEPs (e.g., those from Italy) this change induced a large reduction in salary, while for others (e.g., those from Hungary and Spain), it meant a big raise.

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<sup>1</sup>Such activities are commonly used to measure legislative output. For example, see Dal Bo and Rossi (2011)

<sup>2</sup>As we will explain in greater detail later, there is a small fraction (4.5%) of MEPs for whom this salary change did not apply.

Two closely related papers exploit the same policy change. In concurrent work, Mocan and Altindag (2013) examine the impact of the salary change on MEPs' effort. More recently, Braendle (2014) examines the effect of salary on behavior and selection of MEPs. Our analysis is complementary to these papers as we examine a number of new outcomes (willingness to run for reelection, MEPs' tenure and education quality, number of parties that field a candidate, shirking, etc.). Also, we provide first evidence on the specific channel through which selection effects operate.

In the parts of our analysis that do intersect with Mocan and Altindag (2013) and Braendle (2014), our conclusions differ in two regards. First, we do not find that the salary change has a significant impact on MEPs' effort. We replicate Mocan and Altindag's (2013) point estimate, which is quite small, and when we cluster standard errors at the country level<sup>3</sup> – the level at which salaries vary – the effect is not statistically significant. Braendle (2014) finds that the apparent impact of salary on effort depends on the measure of effort.<sup>4</sup> Second, we find that high salaries reduce the quality of elected MEPs (as proxied by the quality of the colleges they attended), while Braendle (2014), using alternative measures of MEPs' human capital, finds no significant impact. His confidence intervals, however, also admit the possibility of substantive, negative selection effects.<sup>5</sup>

In our analysis, we first look at the impact of the salary change on MEPs' willingness to hold office. Using a differences-in-differences approach, we show that doubling an MEP's salary increases the probability she runs for reelection by 23 percentage points. Moreover, an increase in salary substantially reduces the likelihood that an MEP will quit before the end of her term. These results suggest that monetary remuneration plays an important role in the willingness to hold political office. This is consistent with standard models of labor supply, and implies that – despite non-pecuniary motivations and the role of post-political employment – salary is of first-order importance in politicians' labor supply. (In contrast to our results, Diermeier *et al.* 2005 argue that salary is a secondary consideration in the U.S. Congress.)<sup>6</sup>

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<sup>3</sup>Mocan and Altindag (2013) cluster their standard errors at the MEP level.

<sup>4</sup>Specifically, higher salaries reduce attendance, increase plenary speeches and written declarations, and have no detectable impact on the number of reports drafted.

<sup>5</sup>For example, he can only rule out that doubling the salary lowers the fraction of MEPs with a doctoral degree by more than 18%.

<sup>6</sup>It is important to note that the elasticity of labor supply in general depends on substitute options. In our context, there is a political position that is a reasonably close substitute to being an MEP, namely serving in the home country parliament. Consequently, the impact of salary on the supply of political candidates may be somewhat lower in other

Since a higher salary increases incumbents' willingness to stay in office, it also increases the average tenure of MEPs. This change in MEP composition may be important given the role of experience in the production of legislative output. Higher salaries, however, also induce a negative selection effect on the other dimension of MEPs' human capital: doubling the salary decreases the probability that an elected MEP attended a top college by 4.5 percentage points, or 15 percent. Our data allow us to identify a simple channel behind this negative selection – the decision to run for reelection among MEPs who attended a highly ranked school is less sensitive to salary than is the case for MEPs who did not.

We also analyze the impact of salaries on MEPs' behavior in office. Our main measure of effort is attendance – the fraction of days during which an MEP participated in parliamentary activities (as evidenced by her voting record). We also construct a variable that captures a more explicit form of shirking: each day they are present at the parliament, MEPs are meant to sign a register to prove their attendance, entitling them to a daily allowance of roughly €300.<sup>7</sup> MEPs have sometimes abused this system, showing up only to sign the register. Such behavior has been a source of scandal. In 2004, for example, Austrian MEP Hans-Peter Martin filmed other MEPs signing the register shortly after 7am and then immediately leaving the building. His footage was widely broadcast and caused a public uproar.<sup>8</sup> Combining records from the daily register with voting data, we identify for each MEP any days on which she signed the register but was then absent from all the votes held that day; we call such behavior shirking.

We find no effect of salaries on either attendance or shirking. This result might be driven by the somewhat limited monitoring of politicians' effort by the electorate. In contrast to this inefficacy of salaries, we find that home country corruption strongly correlates with both attendance and shirking. This suggests that, whereas salary plays a significant role in the selection of politicians, social norms and non-pecuniary concerns are a more important determinant of politicians' behavior while in office.

In summary, we find that salary has a different impact on the various inputs into legislative process. Increasing the salary has no discernible influence on effort and has offsetting effects on the

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settings.

<sup>7</sup>The size of the daily allowance changes somewhat over time.

<sup>8</sup>See, for example, "European Elections: Martin's Travels," *The Economist*, June 3, 2004.

two dimensions of human capital: it lowers college quality but increases tenure. When we consider the reduced form relationship between salary and legislative output, we find that these effects net out to essentially zero; the estimated coefficient is small and we can reject the null that doubling salaries increases output by more than a fifth of a standard deviation.

Finally, we also examine the impact of salaries on political competition. Unlike the United States, most European countries have a large number of politically active parties. Sometimes, small parties that focus primarily on European politics form to field candidates in EP elections. Also, existing parties often merge or split into separate entities. These features of European politics induce substantial variation over time in the number of parties from a given country that field candidates to the EP. We find that the supply of political parties is sensitive to salaries: doubling the salary increases the logarithm of the number of parties that field a candidate by 41 percent of a standard deviation.

Throughout the paper, our key identifying assumption is that the timing of the salary reform is uncorrelated with other factors that would lead politicians from initially-low-salary countries to change their behavior relative to politicians from initially-high-salary countries. One particular concern is that the reform may have been passed precisely when MEPs from low-salary countries were more likely to run for reelection and thus were particularly motivated to raise future salaries. Two sets of facts speak against this alternative explanation. First, such reverse causality could not account for the increase in the number of parties that field candidates when salaries increase. Second, we demonstrate that whether an MEP voted for or against salary harmonization is uncorrelated with whether the proposal would raise or lower her salary.<sup>9</sup> While data limitations prevent us from analyzing long-term pre-treatment trends, for some of our outcome variables we do test whether salary change is correlated with changes in outcomes from 1999 to 2004, prior to the new policy.

The results in our paper examine the overall impact of salaries on politician- and country-level outcomes. There are many potential channels through which salaries might impact these outcomes. A higher salary, for example, might make it more difficult for an incumbent politician to convince her party to keep her on the party list, or could attract other candidates whom voters might prefer.

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<sup>9</sup>Moreover, whether an MEP voted for or against salary harmonization is uncorrelated with whether that MEP subsequently runs for reelection.

In other words, salaries might affect not only labor supply but also labor demand. Our results should thus be interpreted as estimates of how salaries influence the *equilibrium* outcomes of the game between incumbents, challengers, political parties, and voters. Our data do not provide guidance on the mechanisms behind the effects, but the most direct channel through which salaries might impact outcomes is by (selectively) influencing the politicians’ willingness to hold office.

A large literature examines the theoretical relationship between politicians’ wages and politicians’ quality, performance, and willingness to run for office. Caselli and Morelli (2004) consider a setting where market skills and political skills are correlated, so higher wages attract candidates with greater political skill. Besley (2004) develops a model where higher wages compel politicians to care more about reelection; an increase in wages thus induces politicians to cater more to voters’ preferences while in office. Higher wages, however, could in principle also create negative selection effects (as our results on college quality suggest to be the case). Besley (2004), for example, points out that the existence of non-pecuniary incentives for “public spirited” candidates might cause higher wages to attract worse candidates. Poutvaara and Takalo (2007), Mattozzi and Merlo (2008), and Gagliarducci, Nannicini, and Naticchioni (2010) consider models where high-ability individuals self-select into politics; consequently, higher wages lower the ability threshold at which potential candidates decide to seek office.<sup>10</sup> These concerns about possible negative selection are shared by practitioners. New Hampshire, for instance, has deliberately kept legislators’ salaries at \$100 a year, claiming that this system attracts a more committed “citizen” legislature.

In contrast to theoretical work, there is a relative paucity of empirical research on the labor market for elected officials. Outside of politics, one can often use exogenous shocks to labor demand to identify the elasticity of labor supply, but this approach is not feasible for politicians. Moreover, since salaries are typically set by those currently in office, it is usually difficult to rule out the possibility that politicians’ skill affects their salaries rather than vice versa. A recent pair of papers overcomes these difficulties by exploiting discontinuities of politicians’ salaries in population size: Ferraz and Finan (2010) and Gagliarducci and Nannicini (2013) examine the impact of wages on labor supply and the performance of Brazilian municipal legislators and Italian mayors, respectively.

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<sup>10</sup>Messner and Polborn (2004) study a model where candidates are motivated to run in part because they care about political duties being executed effectively. In this setting, higher wages can decrease the quality of elected officials since higher wages allow skilled individuals to more easily free-ride on the participation of others.

Both papers find that higher wages attract more candidates and higher quality candidates. Ferraz and Finan (2010) find evidence that higher wages induce higher effort, while Gagliarducci and Nannicini (2013) find this channel to be unimportant. Apart from these two papers, there have been other attempts to analyze the motivation of politicians. Kotakorpi and Poutvaara (2011) study the effect of a wage increase in the Finnish National Parliament. Using candidates in municipal elections as a control group, they report that the wage increase led to more educated female candidates but had no effect on the composition of male candidates. Di Tella and Fisman (2004) present evidence that better state-level economic performance allows U.S. governors to push up their own salaries, while Besley (2004) finds that U.S. governors' salaries increase when their policies are congruent with voter preferences. Groseclose and Krehbiel (1994) and Hall and van Houweling (1995) report that U.S. congressmen respond to changes in the financial incentives for retirement. The structural estimation exercise of Keane and Merlo (2010) suggests that a reduction in salaries would lower the quality of the Members of the U.S. Congress. Conversely, the comprehensive study of U.S. governors and state legislators by Hoffman and Lyons (2013) shows almost no correlation between salary changes and changes in politician performance or quality.

We contribute to the existing literature in three ways. First, in contrast to most earlier work, the European Parliament wage equalization provides us with a credible source of identification of the impact of politicians' salaries. (Earlier in this introduction we discussed the relationship of our work to Mocan and Altindag (2013) who also draw on the same source of identification.) Second, in contrast to Ferraz and Finan (2010) and Gagliarducci and Nannicini (2013), we examine the impact of salary on the composition and behavior of politicians at higher levels of government. The differences between our results and theirs suggest there may be important variation in the motivations of politicians at different levels of government. Finally, some of the outcomes we analyze, such as the supply of political parties, have not been studied at all in previous work.

## **2 Data and institutional background**

The European Parliament (EP) is the lower legislative chamber of the European Union (EU). Since 1979, Members of the European Parliament (MEPs) have been elected every 5 years. The present

paper focuses for the most part on the 5th, 6th, and 7th parliaments, elected in 1999, 2004, and 2009 and consisting of 626, 732, and 736 MEPs, respectively.<sup>11</sup> Throughout the paper, we will refer to the  $n^{\text{th}}$  parliament as  $EPn$ .

Each EU member country elects its own MEPs in nationally held elections. The precise electoral rules differ by country. Importantly for our purposes, many countries utilize closed-list electoral systems where voters effectively vote for political parties as a whole, rather than for particular candidates.<sup>12</sup> In such countries, competition takes place at the party-level rather than at the individual-level. Consequently, when we analyze the effect of salary on prospective politicians' willingness to run for office, we focus on incumbents' willingness to run for reelection and on the number of parties that field candidates rather than on the overall number of candidates.

The work of the European Parliament is centered around the plenary sessions held once or twice a month. These sessions consist of several daily "sittings" of debate and voting. MEPs sign attendance registers on each day of a plenary session. The registers are subsequently published in conjunction with the minutes of the sittings. Similarly, for those votes that are held as roll-call votes, individual voting is registered and published.

MEPs are remunerated through allowances as well as a monthly salary. Along with reimbursement for travel, staff, and other expenses, MEP allowances include a stipend that is awarded for each day of a session if the MEP signs the attendance register. This daily stipend is reduced by a half if the MEP votes on fewer than 50 percent of the roll-call votes that day. Signing the register and then immediately leaving is frowned upon, as evidenced by the scandal discussed in the introduction.

Prior to EP7, MEPs were paid by the member states and earned the same salary as members of the lower chamber of their respective national parliaments. This system was originally put in place in 1979 as a placeholder until the European Parliament could decide on a uniform system and level of salaries. The initial, national-based system, however, remained in place for nearly three decades. A new system was finally agreed upon and passed into law in 2005. It became effective as of EP7. The new system established a uniform salary for all MEPs, paid from the European

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<sup>11</sup>When Romania and Bulgaria joined the EU in 2007, the total number of MEPs temporarily increased to 785 until the 2009 election.

<sup>12</sup>There are only nine countries with open-list electoral systems.



budget and equal to 38.5% of the salary of a judge at the European Court of Justice. This was about €84,000 at the time the statute was passed and about €92,000 when EP7 commenced in the summer of 2009. Since all of our specifications use the change in salaries, the results do not depend on what we set as the level of post-harmonization salary. The statute was passed with two provisos: (i) if any member state wished all of its MEPs to continue to receive the old, national salary, this would be permitted for a maximum of two parliamentary terms and would be paid for by the member state, and (ii) any individual MEP who was already in office before the new statute was passed could elect to continue to receive the old, national salary (paid by her own member state) for as long as she continued in office. In practice, these provisions had little impact on the implementation of a uniform salary because: (i) no member state elected to continue to pay the old salaries for its MEPs, and (ii) only 33 MEPs exercised the option to retain the old national salaries.<sup>13</sup> We have been able to identify only 5 of these 33 MEPs, so we cannot exclude all MEPs with unchanged salaries from our analyses. That said, they comprise less than 5 percent of the sample, so their effect on our estimates is likely to be small. Since their salaries did not actually change, they are likely to bias our estimates toward zero.

The data employed in this paper are derived from a number of sources. Our measure of legislative productivity is derived from listings of parliamentary activities on MEPs' individual pages on the EP website.<sup>14</sup> In particular, we collect data on *Questions, Motions for Resolution, Reports, Written Declarations, and Speeches in Plenary*.<sup>15</sup> Following a procedure similar to that of Dal Bo and Rossi (2011), we normalize each of these five activities in each year<sup>16</sup> by subtracting the mean and dividing by the standard deviation. We then add the five normalized activities to obtain our summary measure  $LegislativeOutput_{it}$  where  $i$  indexes MEPs and  $t$  indexes years.

We provide a validation of our measure of legislative output by examining its correlation with media exposure. We searched the Foreign Language News database in LexisNexis for the name of each MEP. This database provides coverage of at least one news source in every EU country

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<sup>13</sup>At first glance it might seem surprising that MEPs who received a pay cut would not elect to keep their old salaries. Doing so, however, would require transferring the burden of payment from the European Parliament to the taxpayers of one's own country, which might not be popular with the electorate. More broadly, many legislative bodies have the legal power to raise their own salaries and yet seldom choose to do so.

<sup>14</sup>See <http://www.europarl.europa.eu/parlArchives/mepArch/alphaOrder.do?language=EN>, last accessed July 6, 2012.

<sup>15</sup>Detailed description of these variables is in the Appendix.

<sup>16</sup>We define EP years to be from June 23 to June 22, based on the electoral calendar of the parliament.

(generally many more). There is a relatively small number of instances where media citations exceeded the database’s limit of 3000, and these values were top coded as 3000. In most cases, these were prominent politicians (e.g., Daniel Cohn-Bendit and Jean-Marie le Pen). In other cases, the MEP’s name was shared with another famous individual (e.g., one MEP shared his name with author Thomas Mann and another with soccer player Jan Mulder). These shared names introduce classical measurement error. We define  $\ln MediaMentions_{it}$  as the logarithm of one plus the number of articles mentioning MEP  $i$  in year  $t$ .

We build on previous data collection efforts by Hix, Noury, and Roland (2007) to construct two measures of MEPs effort. As mentioned previously, a sitting is a day-long meeting of the parliament during which roll-call voting takes place. We define  $Attendance_{it}$  as the proportion of sittings in year  $t$  during which MEP  $i$  participated in at least one of the roll-call votes during the day. (An abstention counts as a vote.) Additionally, motivated by the scandals mentioned in the introduction, we define  $Shirking_{it}$  as the fraction of those sittings in year  $t$  when MEP  $i$  signed the attendance register but cast zero roll-call votes.<sup>17</sup> There are legitimate reasons an MEP might sign the register but fail to participate in votes – for example, she might spend the entire day in meetings. That said, we find that  $Shirking$  is strongly correlated with the level of corruption in MEP’s home country, which suggests that our less favorable interpretation accounts for at least some portion of this behavior.

We consider two main measures of human capital: educational background and tenure. We use global rankings of colleges attended by MEPs as a measure of education quality. We identified where MEPs attended college from the MEPs’ individual websites. We were able to obtain this information for nearly 90 percent of the sample. We merged these data with the 2010 Academic Ranking of World Universities, which provides a rank for the top 500 universities in the world.<sup>18</sup>  $TopSchool_i$  is an indicator variable denoting whether MEP  $i$  attended a school ranked in the top 500. Most MEPs attend college in their home country, and countries vary widely in their universities’

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<sup>17</sup>Data on voting and signatures in the register for EP6 and EP7 was collected from the European Parliament website, <http://www.europarl.europa.eu/activities/plenary/home.do?language=EN>, between February 2007 and October 2010. For EP5, we collected data on signatures in the register, which we combine with voting data from Hix, Noury, and Roland (2007).

<sup>18</sup>Since rankings change, albeit slowly, over time, it would have been more suitable to utilize the rank of a school at the time when the MEP attended it, but the available data only go back to 2003 and many MEPs have been out of college for more than seven years.

representation in the ranking. Consequently,  $TopSchool_i$  is not particularly useful for identifying cross-sectional variation in the quality of MEPs across countries, but it does capture the change in quality of MEPs from a given country over time. We also obtained data from MEPs' individual websites on each MEP's periods in office, which we use to define  $lnTenure_{ip}$ , the logarithm of the number of years since MEP  $i$  first served in the European Parliament, as of the beginning of parliament  $p$ .

Our main interest will be in understanding how human capital and effort are affected by MEP salaries. We obtained data on pre-equalization salaries from Corbett, Jacobs, and Shackleton (2005), using salaries as of December 2004 as the measure of the salary level in the 6th parliament (2004-2008). Our key independent variable  $\Delta lnSalary_c$  is defined as a constant (the post-change uniform salary level) minus the logarithm of the salary for MEPs from country  $c$  as of December 2004.<sup>19</sup>

For our measures of incumbents' willingness to stay in office, we focus on whether an MEP quit before the end of her term and, if not, whether she ran for reelection. For EP6 and EP7, for each MEP who served in the previous parliament, we define an indicator variable  $PostVoteQuit_{ip}$  which equals 1 if MEP  $i$  quit her job before completing her term at some point after the first year of parliament  $p-1$ . For  $p=7$ , this indicates that the MEP quit the parliament during EP6, sometime after the vote on the salary change. For  $p=6$ , this indicates she quit the parliament during the same segment of the electoral cycle in EP5, the parliamentary session that took place prior to the introduction of salary change legislation. We also define a variable  $Rerun_{ip}$  that indicates whether MEP  $i$  ran for reelection for parliament  $p$ . Both variables are constructed using data from the EP website.<sup>20</sup> A number of countries joined the EU in May of 2004, six weeks prior to the June elections for EP6. Those countries had appointed, non-elected, MEPs for the end of EP5 (Corbett *et al.* 2005). For those MEPs,  $Rerun_{ip}$  simply indicates whether they ran for election in EP6. As we discuss in Section 5, our results are unchanged when we include controls for whether a country

<sup>19</sup>We also considered the tax-adjusted salary change, using the top marginal tax rate in the home country. Since the tax rates are uncorrelated with initial salaries, this alternative measure yields very similar results.

<sup>20</sup>Data on when MEPs left the parliament was collected in August 2009 from individual MEPs' pages on the EP website, <http://www.europarl.europa.eu/members/archive/alphaOrder.do?language=EN>. Data on whether incumbent MEPs ran for reelection in 2004 was taken in July 2009 from <http://www.europarl.europa.eu/parliament/archive/staticDisplay.do?language=EN&id=75>. Information on whether MEPs ran for reelection in 2009 was downloaded during the election in June 2009.

joined the EU in 2004.

We also collected data on the number of parties that fielded candidates for EP6 and EP7.<sup>21</sup> The available data only include parties that received at least 0.5% of the vote. Accordingly, we define  $\ln NumParties_{cp}$  as the logarithm of the number of parties in country  $c$  that received at least 0.5% of the vote for candidacy to parliament  $p$ .

In many specifications, we include basic MEP and country-level controls. The EP website provided us with data on each MEP's age, on the basis of which we define self-explanatory variables  $Age_{it}$  and  $Age_{it}^2$ . We collect country-by-year data on GDP per capita in constant 2000 U.S. dollars, ( $\ln GDP_{ct}$ ) from the World Development Indicators. Finally, as our measure of corruption ( $Corruption_{ct}$ ) we use data from Kaufmann, Kraay, and Mastruzzi (2010). These data consist of a composite corruption index that is essentially the first principal component of a number of other commonly used corruption indices – usually subjective measures based on surveys of country experts and investors. These data are available since 1996. We reverse the sign of the original measure so that higher values indicate greater corruption. By construction, the mean value of this measure across all countries in the global sample is zero with standard deviation one; for our sample of European countries it ranges from -2.42 to -0.55. Table 1 reports summary statistics for the variables used in our analysis.

### 3 Legislative production function

To organize our analysis, we consider a highly stylized model of how MEPs produce and improve legislation. Drawing on the idea of a production function  $Y = F(K, L)$  where output  $Y$  is produced using capital  $K$  and labor  $L$ , suppose that  $LegislativeOutput = F(TopSchool, \ln Tenure, Attendance)$ . That is, in order to create legislative output, MEPs draw on their human capital ( $TopSchool$  and  $\ln Tenure$ ) and exert effort ( $Attendance$ ). In this section, we analyze this production function. In the next section, we then examine how salary impacts the composition ( $TopSchool$  and  $\ln Tenure$ ) and behavior ( $Attendance$ ) of MEPs. Note that we view the initial set of results, which show that MEP inputs are correlated with legislative output, primarily as a means of motivating our main

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<sup>21</sup>Downloaded from [http://www.europarl.europa.eu/parliament/archive/elections2009/en/new\\_parliament\\_en.html](http://www.europarl.europa.eu/parliament/archive/elections2009/en/new_parliament_en.html) and [http://www.europarl.europa.eu/parliament/archive/elections2009/en/hist\\_results\\_be\\_en.html](http://www.europarl.europa.eu/parliament/archive/elections2009/en/hist_results_be_en.html) accessed in July 2009.

analysis, rather than as evidence of a causal link from inputs to output.

The assumption that experience increases productivity is quite natural. Since experience in the present context is equivalent to tenure in office however, a possible concern with our experience measure is that higher political tenures may simply reflect a lack of electoral competition. For education, it is also not obvious that college quality captures human capital that is relevant for politicians. Prior work has established that this variable strongly predicts success in the labor market at large. For example, Kane (1998) shows that, in the United States, attending a college with a 100 point higher average SAT score is associated with 3 to 7 percent higher earnings later in life.<sup>22</sup> That said, market skills may or may not be positively correlated with political skills. Finally, while attendance and participation in voting clearly measures one dimension of politician effort, our effort measure may still miss other important dimensions such as persuasion efforts between meetings.

Despite these concerns with our measures of MEP inputs, Table 2 below, however, shows that our three measures of human capital and effort correlate strongly with legislative output. Specifically, consider the following OLS specification:

$$LegislativeOutput_{ict} = \alpha_c + \gamma_t + \beta_1 \times TopSchool_{ic} + \beta_2 \times lnTenure_{ict} + \beta_3 \times Attendance_{ict} + \varepsilon_{ict}$$

where  $\alpha_c$  indicates country fixed effects and  $\gamma_t$  indicates year fixed effects. Standard errors, as in all specifications in this section, are clustered at the MEP level. The sample includes all MEP-year observations during EP5, EP6, and the first year of EP7, i.e., those years for which attendance data are available.

Column (1) shows that  $\hat{\beta}_1$  is significantly positive ( $p < 0.01$ ): MEPs who went to better schools generate more legislative output. Estimates of  $\beta_2$  and  $\beta_3$  are also significantly positive – more experienced MEPs<sup>23</sup> and those MEPs who attend more sessions tend to be more productive. Column (2) adds country by year fixed effects, Column (3) includes additional MEP-level controls,

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<sup>22</sup>Most of the literature on this topic strives to disentangle the causal impact of college quality on future earnings from selection effects (e.g., Dale and Krueger 2002). For our purposes, however, it does not matter whether college quality causes or simply predicts high permanent income.

<sup>23</sup>It is possible that only *relative* tenure matters for legislative output, i.e., it could be that more senior, rather than more experienced, politicians generate more output. Given our data limitations, however, we are not able to examine this distinction empirically.

and Column (4) includes MEP fixed effects. The estimates of  $\beta_1$  through  $\beta_3$  are stable across specifications. Column (4) in particular confirms that  $\hat{\beta}_3 > 0$  is not capturing some time-invariant characteristics of MEPs that cause both high attendance and high productivity: a given MEP produces more output in years when she attends more sessions. The positive estimate of  $\beta_3$  also supports our view that participation in roll-call votes captures effort rather than a lack of non-voting duties.

In Table 3, we provide some evidence for the validity of our measures of legislative output, human capital and effort by relating them to media coverage.<sup>24</sup> In Column (1), we consider the OLS specification:

$$\ln MediaMentions_{ict} = \alpha_{ct} + \beta_1 \times LegislativeOutput_{ict} + \varepsilon_{it}.$$

The estimate of  $\beta_1$  in Column (1) is positive ( $p < 0.01$ ), and the coefficient is largely unchanged when we include country-by-year fixed effects in Column (2). In Column (3) we replace our measure of legislative output with our three measures of MEP inputs: *TopSchool*, *lnTenure* and *Attendance*. MEPs with longer tenure unsurprisingly get more media coverage, but so do MEPs with lower attendance. The negative correlation between attendance and media coverage might reflect the possibility that more famous MEPs incur a greater opportunity cost to participate in the legislative process. Finally, the results in Column (4) show that a given MEP generates more news coverage in the years when she generates more *LegislativeOutput*, alleviating concerns that some time-invariant MEP characteristic induces a spurious correlation between output and news coverage.

In the remainder of Table 3, we analyze how our measures of legislative output, human capital and effort correlate with the likelihood of an MEP being reelected, conditional on rerunning. In Column (4), we consider a linear probability model:<sup>25</sup>

$$Reelected_{icp} = \alpha_{cp} + \gamma_p + \beta_1 \times LegislativeOutput_{icp} + \varepsilon_{ip}.$$

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<sup>24</sup>Of course, media coverage is an imperfect indicator of politician performance. Politicians involved in scandals, for example, receive large amounts of news coverage.

<sup>25</sup>Throughout the paper we use a linear probability model when the outcome variable is binary. We obtain very similar results if we use logit or probit specifications instead.

Since *Reelected* is observed only once each EP, the analysis for this specification is at the MEP by EP level, with the constituent components of *LegislativeOutput* aggregated and normalized at the EP rather than the annual level. As Column (5) and (6) show, MEPs who generated more legislative output are more likely to be elected, conditional on rerunning. Finally, Column (7) replaces our measure of legislative output with our three measures of MEP inputs. All three measures correlate positively and significantly with reelection. The results in Columns (5)-(7) should be interpreted with considerable caution, however, since we are looking at reelection results conditional on the fact that the MEP chose to run for reelection. With that caveat in mind, our estimates provide suggestive evidence that voters might prefer MEPs who generate more legislative output, who have higher human capital, and who exert more effort.

## 4 Impact of salary change

As we mentioned earlier, in the past MEPs received the same salary as members of the lower house of their own national parliament. Table 4 reports MEPs' salaries by country as of December 2004, during the 6th parliament, along with the number of MEPs that represent each country.<sup>26</sup> Starting with EP7, which began in July 2009, salaries were equalized for all MEPs. As a point of comparison, we also include MEPs' salaries by country in December, 1999, nearly the beginning of the 5th parliament, along with the evolution of seat allocations across the 5th, 6th, and 7th parliaments. The change in the number of seats assigned to each country between EP6 and EP7 is virtually uncorrelated with the salary change across the two parliaments ( $\rho = -0.06$ ), indicating that our analysis of the effect of salary changes is unlikely to be confounded by concurrent changes in seat apportionment.<sup>27</sup>

In this section, we analyze the impact of the salary change on the composition and the behavior of MEPs.

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<sup>26</sup>Salaries changed somewhat during EP6, but for all our specifications we use the salary from this particular point in time. This is clearly appropriate for analyzing the impact of salary change on the willingness to run for reelection, but it does introduce some (classical) measurement error in the analysis of how salary change impacts the behavior of MEPs during EP6.

<sup>27</sup>In particular, all of the empirical results presented below are robust to controlling for changes in the number of seats allocated to each country.

## 4.1 Incumbents' willingness to stay in office

We first examine how salary influences the willingness of incumbent MEPs to remain in office. This is a natural starting point as it provides a simple measure of politicians' extensive margin of labor supply and it illustrates a channel through which salaries might affect the composition (in particular average tenure) of MEPs.<sup>28</sup>

We consider a linear probability model:

$$Rerun_{icp} = \alpha_c + \gamma_p + \beta_1 \times EP7_p \times \Delta \ln Salary_c + \varepsilon_{icp} \quad (1)$$

where  $\alpha_c$  indicates country fixed effects,  $\gamma_p$  indicates parliament fixed effects,  $p \in \{6, 7\}$ , and  $EP7_p$  is an indicator variable for whether  $p = 7$ . The sample consists of all MEPs who served in EP5, and those MEPs who served in EP6 and joined the parliament prior to the announcement of the salary change.<sup>29</sup> The variable  $Rerun_{ip}$  denotes whether MEP  $i$  ran for reelection for parliament  $p$ , and  $\Delta \ln Salary_c$  is the salary change instituted at the beginning of EP7. For this specification, as for all others in this section, we report robust standard errors clustered by country. Given the small number of countries in our data, however, we have also assessed the statistical significance of all coefficients of interest using bootstrap methods that are robust to the presence of few clusters. Specifically, we use the *wild cluster bootstrap-t* method proposed by Cameron, Gelbach, and Miller (2008). Bootstrap-based results are virtually identical to those presented, except where noted in the text.

Table 5, Column (1) reports the results of the baseline specification in Equation (1). The estimate of  $\beta_1$  – the coefficient which captures the impact of salary change on the willingness to run for reelection – is 0.30 ( $p < 0.01$ ). Column (2) adds country by EP controls ( $\ln GDP_{PC}_{cp}$  and  $Corruption_{cp}$ ); these variables are measured in the last year of parliament  $p - 1$ , i.e., at the time when an MEP was likely making the decision of whether to run for reelection. Column (3) adds MEP by EP controls ( $\ln Tenure_{ip}$ ,  $Age_{ip}$ , and  $Age_{ip}^2$ ), also measured in the last year of parliament  $p - 1$ . The estimate of our key coefficient of interest,  $\beta_1$ , is stable across these specifications. The

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<sup>28</sup>Salaries might also influence the supply of challengers or the incumbency advantage, but as we will demonstrate in the next subsection, the increased willingness of incumbents to run for reelection indeed leads to greater average tenure.

<sup>29</sup>This means that we exclude all MEPs from Romania and Bulgaria since they joined in 2007.



estimate in Column (3), which is our preferred specification, implies that doubling an MEP’s salary increases the likelihood she will run for reelection by 23 percentage points ( $\ln(2) \times \hat{\beta}_1 = 0.23$ ). Given that on average 57 percent of MEPs seek reelection, this constitutes a 40 percent increase in labor supply.

In Figure 1, we depict the correlation between salary change and the change in the fraction of MEPs who run for reelection between EP6 and EP7. Each country is denoted by a circle that is proportional to the number of MEPs from that country.<sup>30</sup> The circles are shaded based on each country’s electoral system. Countries in the European Union utilize one of three basic types of voting systems. In open-list systems, voters cast votes for particular candidates (most of whom are identified with a party). In closed-list systems, voters vote for parties, each of which maintains a list of candidates. Finally, in ordered-list systems, voters can either vote for a party or for an individual on a party list, but a high proportion of votes is required to undo the party-mandated ordering of candidates. The process of seeking reelection thus differs as a function of the electoral system employed: in an open-list system, a candidate directly chooses to run while in a closed-list system she needs her party’s approval to do so. As Figure 1 reveals, however, the positive relationship between salary change and the increased willingness to run for reelection does not seem driven by countries with a particular electoral system.

A somewhat stronger way to express diminished interest in serving as an MEP is to quit before the term expires. We consider a linear probability model:

$$PostVoteQuit_{icp} = \alpha_c + \gamma_p + \beta_1 \times EP7_p \times \Delta \ln Salary_c + \varepsilon_{icp}.$$

The sample is the same as in the previous specification. Recall that  $PostVoteQuit_{ip}$  equals 1 if MEP  $i$  quit her job before completing her term at some point after the first year of parliament  $p - 1$ . For  $p = 7$ , this indicates quitting the parliament during EP6, after the vote on the salary change. For  $p = 6$ , this indicates quitting the parliament during the same segment of the electoral cycle, but in EP5, the parliamentary session before the salary change had been introduced. Table 5, Column (4) reports the baseline results, Column (5) adds country by EP controls, and Column

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<sup>30</sup>The number of MEPs from a country is not exactly proportional to the number of country’s seats (listed in Table 4) due to within-EP turnover in MEPs.

(6) adds MEP by EP controls. The estimate of  $\beta_1$  is negative, but small and insignificant when neither MEP-level nor country-level controls are included. In Columns (5) and (6), we observe that  $\beta_1$  is significant at least at the 5 percent level, with a magnitude of about  $-0.10$ . This estimate implies a very large impact of salary, given that the mean of *PostVoteQuit* is 0.11.

Overall, the results in this subsection suggest that the salary associated with a political office has a substantial impact on the willingness to hold that office. We next turn to the impact of salary on the composition of elected MEPs.

## 4.2 Composition of MEPs

The fact that higher wages increase the willingness to hold a political office does not by itself imply that the quality of elected officials will increase. In fact, as discussed in the introduction, there are several theoretical models which suggest that a higher salary could lower the quality of candidates and elected politicians. In this subsection, we analyze how the change in the salary impacts the characteristics of elected MEPs. We focus on pre-determined characteristics - tenure and education - that could not have been directly influenced by the salary.<sup>31</sup>

### 4.2.1 Tenure

As noted in the previous subsection, higher salaries induce more incumbents to run for reelection. Since incumbents clearly have longer tenure than challengers,<sup>32</sup> we may expect higher salaries to increase the tenure of MEPs. In Table 6, we consider the following OLS specification:

$$\ln Tenure_{icp} = \alpha_c + \gamma_p + \beta_1 \times EP7_p \times \Delta \ln Salary_c + \varepsilon_{icp}.$$

The sample consists of all MEPs who served in EP6 and EP7. Column (1) reports the results of the baseline specification; in column (2) we add country by EP controls. The estimate of  $\beta_1$  is positive, significant ( $p < 0.01$ ), and stable across the two specifications. Increasing salary indeed results in

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<sup>31</sup>In unreported results, we also examine the impact of salary change on the age of MEPs. We find that higher salaries result in older MEPs, largely because incumbents tend to be older than freshmen. When we look at how the distribution of age is affected, we find that the age increase is largely the result of a shift from young (under 40) MEPs to middle-aged MEPs (40-59), rather than a shift to old (60+) MEPs. This suggests that the higher salary is not attracting MEPs who otherwise might exit the workforce entirely.

<sup>32</sup>This is not true by definition. It is in principle possible for an MEP who has been in the parliament before and then left to seek a new term of office. In practice, however, such discontinuous service records are relatively rare.

longer-tenured MEPs. The magnitude of  $\hat{\beta}_1$  can be interpreted as an elasticity: a 1% increase in salary results in about 0.25% increase in tenure.

#### 4.2.2 Education

In Section 3, we show that MEPs who attended a top school tend to be more productive. Here, we examine whether the change in salary impacts the educational background of MEPs. We consider OLS specifications of the form:

$$TopSchool_{icp} = \alpha_c + \gamma_p + \beta_1 \times EP7_p \times \Delta \ln Salary_c + \varepsilon_{icp}.$$

Column (3) of Table 6 reports this baseline specification.<sup>33</sup> In Column (4), we add country by EP controls. The estimate of  $\beta_1$  is negative, significant ( $p < 0.01$ ), and stable across the two specifications. The estimate in Column (4) implies that doubling the salary reduces the likelihood that an elected MEP attended a top university by 4.5 percentage points. Given that around 30 percent of MEPs overall attend a top university, this is a reduction of 15 percent. Columns (5) and (6) of Table 6 examine whether the effect of salary is driven by reelected incumbents or freshmen. As the table shows, the effect is driven largely by reelected incumbents; among the freshmen MEPs, there is no significant effect of salary on education, though we cannot reject equality of the two coefficients owing to a lack of precision ( $p\text{-value} = 0.32$ ).

In Figure 2, we plot  $\Delta \ln Salary_c$  against the change in the fraction of MEPs who attended a top school. As in the previous figure, the size and shading of a circle indicate the number of MEPs and the electoral system, respectively. The figure indicates that the relationship between the two variables is not driven by a particular outlier or electoral system.

Why do higher salaries lead to a negative selection of MEPs? One possibility is that the behavior of lower quality MEPs is more sensitive to salary. In Table 7, we estimate the specification in Equation (1) separately for those MEPs who attended a top college and those who did not. As Columns (1) and (2) show, salaries impact the tendency to run for reelection *only* among lower-quality MEPs ( $TopSchool = 0$ ); the coefficients in Columns (1) and (2) are significantly different

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<sup>33</sup>We drop observations where we were unable to obtain data on undergraduate education, about 10% of the sample. If MEPs with missing data are assumed not to have attended a top school, our results are similar and slightly stronger.

( $p < 0.05$ ). Moreover, the magnitude of this difference is big enough to explain the entire impact of salary change on MEPs educational background.<sup>34</sup> This pattern is consistent with the view that higher quality MEPs (who have better outside options in the market sector) are motivated to hold office due to non-pecuniary returns whereas lower quality MEPs (whose salaries in the market sector would be lower) respond more to salary when deciding whether to run for political office. As the other columns of Table 7 show, we do not observe a differential effect on the decision to stand for reelection based on tenure or attendance.

### 4.3 MEPs' behavior in office

#### 4.3.1 Attendance

Our key measure of MEPs' effort is *Attendance* – the fraction of the days on which an MEP cast at least one vote. As we saw in Section 3, *Attendance* is a key ingredient in legislative output, so any impact of salary on attendance would in turn impact legislative output. In Table 8, we consider OLS specifications of the form:

$$Attendance_{icp} = \alpha_c + \gamma_p + \beta_1 \times EP7_p \times \Delta \ln Salary_c + \varepsilon_{icp}.$$

We use data from EP6 and EP7 and limit the sample to the first year of each parliament to ensure that we are comparing behaviors in the same part of the electoral cycle. (Recall that we only have data from the first year of EP7.) In contrast to our previous tables, we include country-level controls in all specifications and in Column (1) we report results without country fixed effects; we do this to estimate the cross-sectional relationship between attendance and corruption, a point we will return to later. Column (2) adds country fixed effects, and Column (3) adds MEP by EP controls. The estimate of  $\beta_1$  is small and insignificant in each specification. Using our preferred estimate from Column (3), we can reject with 95% confidence that doubling salary increases attendance by more than 16%, or decreases it by more than 10%, of a standard deviation.

Coefficient  $\beta_1$  captures the overall impact (or lack thereof) of salary change on effort. This

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<sup>34</sup>Through this channel, doubling the salary would reduce the fraction of MEPs who went to a top school by  $\ln(2) \times \beta_1 \times Prob(Reelect | Rerun = 1) \times Prob(TopSchool)$ , which equals 0.045 – the same as the observed reduction in Table 6.

coefficient, however, reflects both a treatment effect (the impact on the MEPs who are in office) and a selection effect (the change in the type of MEPs that hold office). In principle, it could be the case that the overall lack of an effect is driven by treatment and selection effects that counteract each other. In Column (4), we include MEP fixed effects. This limits our sample only to those MEPs who were present in both EP6 and EP7 and thus pins down the pure treatment effect of the salary change. Once again, the estimated coefficient is very close to zero and we can rule out large magnitudes; there is no treatment effect. Similarly, referring back to Table 7, Columns (5) and (6) indicate that low and high *Attendance* MEPs are not differentially responsive to salary; there are no selection effects.

### 4.3.2 Shirking

We now turn to the behavior that was at the root of the scandals we discussed in the introduction: MEPs were observed signing the attendance register and then immediately leaving the building. Recall that  $Shirking_{icp}$  is defined as the fraction of those sittings in parliament  $p$  when MEP  $i$  from country  $c$  signed the register but cast zero roll-call votes. In Table 9, we consider OLS specifications of the form:

$$Shirking_{icp} = \alpha_c + \gamma_p + \beta_1 \times EP7_p \times \Delta \ln Salary_c + \varepsilon_{icp}.$$

As in Table 8, we utilize data from EP6 and EP7 and limit the sample to the first year of each EP. Also paralleling Table 8, we include country-level controls in all specifications and in Column (1) we report results without country fixed effects. Column (2) includes country fixed effects and Column (3) adds MEP by EP controls. As with attendance, the estimate of  $\beta_1$  is small and insignificant in all specifications. Using the estimate from Column (3), we can reject with 95% confidence that doubling an MEP's salary increases shirking by more than 15%, or decreases it by more than 23%, of a standard deviation. Moreover, as we can see in Column (4), where we add MEP fixed effects, there is no treatment effect of the salary change on shirking.

### 4.3.3 Importance of social norms in eliciting effort

Our findings on attendance and shirking indicate that increasing salaries is not a potent way to increase the effort of MEPs while in office. In the context of voting participation in the EP, one

possible interpretation of this result is that higher baseline salaries lower the relative importance of the €300 per diem that might otherwise incentivize MEPs to participate in voting sessions. Under this interpretation, however, higher baseline salaries would also make MEPs less likely to shirk (i.e., sign the attendance register on days when do not participate in voting), which we do not observe.

A simpler interpretation for the absence of efficiency wage effects is the lack of direct monitoring of the politicians by the electorate.<sup>35</sup> If the pecuniary incentives to exert effort are weak, the motivation to exert effort may instead be dominated by non-pecuniary considerations, such as the desire to perform one’s public duty. Following Fisman and Miguel (2007), we interpret corruption as a proxy for a country’s social norms and observe that Column (1) in Table 8 and and Column (1) in 9 show that *Corruption* is correlated with both attendance and shirking: MEPs from more corrupt countries are less likely to participate in votes and are more likely to shirk. These effects of *Corruption* are identified from the cross-section; unsurprisingly, when we include country fixed effects, the estimate becomes insignificant as we are using only two years of data. Our data on attendance, shirking, and corruption are available for a much longer time period, however. The corruption data begin in 1996, with annual data for 2002-2010, and biennial data for 1996-2000. For odd-numbered years prior to 2002, we use one year lags to fill in corruption values.<sup>36</sup>

Using this more comprehensive dataset, we estimate OLS specifications of the form:

$$\begin{aligned} Attendance_{ict} &= \gamma_t + \beta_1 \times Corruption_{ct} + \varepsilon_{ict} \\ Shirking_{ict} &= \gamma_t + \beta_1 \times Corruption_{ct} + \varepsilon_{ict}. \end{aligned}$$

In Column (1) of Table 10, we estimate this baseline specification with *Attendance* as the dependent variable; Column (2) includes *lnGDPPC* as a control, Column (3) adds MEP-year controls, and Column (4) includes country fixed effects. The coefficient on *Corruption* is significant ( $p < 0.05$ ) in the first three specifications.<sup>37</sup> The estimate in Column (3) implies that a one standard deviation

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<sup>35</sup>Table 3 indicates a potential link between effort and the likelihood of being reelected but as mentioned earlier, these results should be interpreted with caution as the sample here only includes those MEP who chose to run for reelection.

<sup>36</sup>The results are similar if simply omit those years.

<sup>37</sup>When we use bootstrap inference, significance fall to the 10% level.

increase in corruption (0.72 for the larger sample employed here) is associated with a 9 percentage point, or a third of a standard deviation, decrease in *Attendance* for the 1996-2010 sample. When country fixed effects are included in Column (4), the impact of *Corruption* becomes small and imprecisely estimated. In Columns (5)-(8) we use *Shirking* as the outcome variable. The coefficient on *Corruption* is again significant ( $p < 0.05$ ) in the first three specifications. The estimate in Column (3) implies that a one standard deviation in corruption is associated with a 6.8 percentage point, or 0.38 standard deviations, increase in *Shirking*. The coefficient falls by nearly 75 percent with the inclusion of country fixed effects, and is no longer significant at conventional levels ( $p = 0.11$ ).

Finally, in Appendix Table A1 we examine whether the effects of a salary change - the primary focus of our analysis - are mediated by social norms. We augment the specifications above with the third-order interaction of  $Corruption \times EP7 \times \Delta \ln Salary$  (as well as the relevant two-way interaction terms). Its coefficient is positive and significant, indicating that the behavior of legislators in countries with strong norms against misusing public office responds more positively to a salary increase. This would result, for example, from a standard efficiency wages model of legislator effort where voters (or political parties) in low corruption countries are more inclined to remove shirking MEPs from office. The coefficient on  $Corruption \times EP7 \times \Delta \ln Salary$  is insignificant for all other outcome variables we consider in this table (*Attendance*, *lnTenure*, *TopSchool*).

Overall, the observed empirical patterns favor the view that social norms - as proxied by corruption - are an important determinant of MEP effort, though these results should be interpreted with caution since they rely solely on cross-sectional variation and the estimates are somewhat sensitive to inclusion of additional control variables.

#### 4.4 Overall impact on legislative output

The previous two subsections demonstrate that salary has a different impact on the various inputs into legislative production. There is no discernible impact on effort and there are countervailing effects on the two dimensions of human capital. In this subsection we examine the reduced form relationship between salary and legislative output. Specifically, we consider OLS specifications of the form:

$$LegislativeOutput_{icp} = \alpha_c + \gamma_p + \beta_1 \times EP7_p \times \Delta \ln Salary_c + \varepsilon_{icp}.$$

As in Section 4.3.1, the sample consists of MEPs from EP6 and EP7, with legislative output data limited to the first year of each parliament. In Table 11, Column (1) reports the specification above while Column (2) includes country by EP controls. For completeness, in Column (3) we add MEP-level controls, but including these controls is inappropriate for most purposes: salary might impact legislative output precisely by changing the characteristics of MEPs. Our preferred specification is in Column (2). The point estimate on the overall impact of salary on legislative output is small and we can reject the null that doubling the salary increases legislative output by more than a fifth of a standard deviation ( $\ln(2) \times (0.376 + 1.96 \times 0.338) / 3.42 = 0.21$ ). Hence, our data does not support the view that increasing politicians' salaries is an effective way to improve legislative outcomes. (One reason for this limited response may be the existence of generous per diems that could attenuate the impact of annual salaries on effort.)

#### 4.5 Supply of political parties

As noted in the introduction, the set of political parties from a given country that participate in the elections for the European Parliament varies over time. In this subsection we examine the impact of salaries on the supply of political parties. Ideally, we would also like to know how salary affects the overall supply of candidates, but this is not feasible since only nine member countries have open-list electoral systems. We therefore focus on a measure, the number of parties that field a candidate, that applies equally well to countries that use closed-list and open-list electoral systems (even in countries with open-list systems almost all candidates are associated with some political party). In Table 12, we consider OLS specifications of the form:

$$\ln NumParties_{cp} = \alpha_c + \gamma_p + \beta_1 \times EP7_p \times \Delta \ln Salary_c + \varepsilon_{cp}.$$

Column (1) reports the baseline specification while Column (2) adds country by EP controls. The estimate of  $\beta_1$  in Column (2) is 0.22 ( $p < 0.05$ ).<sup>38</sup> The standard deviation of  $\ln NumParties$  in

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<sup>38</sup>Under bootstrap inference, the coefficient is significant only at the 10% level.



EP6 is 0.37,<sup>39</sup> so  $\hat{\beta}_1$  implies that doubling MEP salaries would increase the logarithm of the number of parties by about 41 percent of a standard deviation.

In Figure 3, we plot the change in  $\ln NumParties_c$  against  $\Delta \ln Salary_c$ . As the figure shows, the positive relationship between the two variables is not driven by outliers.

The impact of salary on the number of parties that field a candidate suggests that increasing politicians' salaries provides the electorate with a broader choice of political platforms. As emphasized by the literature on the valuation of new goods (Bresnahan and Gordon 1997), this broader choice set is likely to increase welfare.<sup>40</sup> Since voters do not express their willingness to pay to have one candidate over another, we obviously cannot compute the associated increase in welfare in monetary terms.<sup>41</sup> Moreover, an increase in the number of parties in the European Parliament may have other, indirect, benefits besides providing the electorate with new platforms they prefer over the existing ones. For instance, it could be that the presence of competing parties causes existing parties to become less corrupt or more responsive to voter preferences.<sup>42</sup>

## 5 Identification concerns

The validity of the analysis in the preceding section rests on the assumption that the timing of the change in salary regime is uncorrelated with a change in other factors that differentially affect MEPs from low-salary and high-salary countries. One concern would be that the salary equalization proposal got passed precisely when MEPs from low-salary countries were more likely to run for reelection and thus particularly motivated to raise future salaries. There are two sets of facts that alleviate this concern. First, this explanation could not account for the increased number of parties that field a candidate when salaries increase. If anything, facing more motivated incumbents would be a deterrent that would lead to fewer challengers. Second, as we report in Table 13, whether an MEP voted for or against salary harmonization is uncorrelated with whether the regime change

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<sup>39</sup>This is somewhat different from the overall standard deviation of  $\ln NumParties$  reported in Table 1, since that calculation includes observations from both EP6 and EP7.

<sup>40</sup>For a caveat, however, see Kamenica (2008).

<sup>41</sup>Also, we cannot use the data on vote shares to estimate the fraction of the electorate whose preferred choice is a new party whose participation was induced by higher salaries since there is substantial entry and exit of parties that participate in European politics.

<sup>42</sup>This is analogous to standard arguments in industrial organization. Even if few consumers buy products from a new entrant, the entry can increase consumer welfare by lowering the prices of incumbent firms.

would raise or lower her salary. Specifically, let  $VoteForSalaryChange_i$  be an indicator variable for whether MEP  $i$  voted for salary harmonization and consider a linear probability model:

$$VoteForSalaryChange_i = \beta_0 + \beta_1 \times \Delta \ln Salary_c + \varepsilon_i. \quad (2)$$

Whether we consider this baseline specification (Column 1), add MEP-level controls (Column 2), or include country-level controls (Column 3), the estimate of  $\beta_1$  is small and insignificant. Alternatively, if we include  $VoteForSalaryChange_i$  as a control in any of the regressions considered above, the results are unchanged.

A separate concern are omitted variables that might be correlated with salary change and affect the outcomes of interest. While we cannot rule out this possibility entirely, we address some concerns that might be seen as significant threats to identification. First, we examine whether any of our results are driven by countries which entered the European Parliament in 2004. Plausibly, late arrivals to the EP might behave differently from long-time members - their norms of attendance may have different trajectories and their rates of political party growth may differ. Moreover, MEPs from countries that joined in 2004 ran for reelection having served as unelected officials in the year prior to the EP6 election, and hence may differ systematically in their characteristics relative to countries that joined in earlier years. This pattern would be problematic since those countries experienced a disproportionate increase in salaries. When limit our sample only to countries that joined the EU prior to 2004, however, none of our results are affected (Table 14, Panel A).<sup>43</sup> Second, while we control for the logarithm of GDP per capita in levels, the period we study coincided with a global recession whose effects were felt to differing degrees across countries in Europe. When we include an additional control for the change in the logarithm of GDP per capita between 2004 and 2009, our results are again unchanged. In Panel B of Table 14, we present our results using the percent change in salary (rather than the log change in salary), with relatively little change in the magnitude or significance of the coefficient on  $EP7 \times \Delta \ln Salary$ .<sup>44</sup>

Another further concern is the presence of other changes in EP-wide or national policies that

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<sup>43</sup>Alternatively, adding as a control an indicator variable denoting that a country entered the European Parliament in 2004 does not affect any of our results.

<sup>44</sup>We also find that our results are unaffected by including a proxy for per diem payments, generated by multiplying the per diem rate by 60, the approximate number of session days each year, as part of each MEP's salary.

occur during our sample period. One significant concern involves the change in rules governing whether an MEP can serve simultaneously in the EP and a national parliament. An EP decision from 2002 removed the possibility of holding such “dual mandates” in all member countries starting from the 2004 elections, with the exception of Ireland where the rule did not go into effect until 2007 and the UK where the rule did not go into effect until the 2009 elections. Such dual mandates appear to have been very uncommon at the time of the reform: in 1999 at the start of EP5, only 8 MEPs served also in a national parliament (Teasdale and Bainbridge (2012)). As an additional check, we have also tried rerunning all of our regressions excluding Ireland and the UK, which were the two countries with staggered introduction of the rules. This does not change any of our results.

Finally, as in any difference-in-difference design, systematic differences in pre-existing trends are a concern for identification. Our outcome variables, however, vary in a meaningful way only at the level of an EP session and country, and going back before EP5 greatly reduces the number of countries in the sample. Accordingly, we analyze pre-treatment trends only for four outcome variables (*PostVoteQuit*, *lnTenure*, *Attendance*, and *Shirking*) and only for the two Parliaments prior to the policy change.

Panel C of Table 14 reports the results. We do not find differential pre-treatment trends in *PostVoteQuit* and *lnTenure* which supports the causal interpretation of our main result that an increase in salary increases MEPs’ willingness to hold office. Among the outcomes that were not influenced by the policy (*Attendance* and *Shirking*) we find no pre-treatment trend for *Attendance* but salary change is indeed positively correlated with the trend in *Shirking*. On one hand, this correlation might be spurious – we cannot reject the joint null that none of the outcomes have a differential pre-treatment trend – but it also opens up the possibility that greater salaries reduce shirking but this effect is masked by differential trends.

## 6 Conclusion

In this paper, we analyze the impact of a salary change on the composition and behavior of politicians in the European Parliament. We exploit a salary reform that provides a credible source identification of financial motives. We focus on the impact of the salary change on human capital

and effort, which we determine to be key inputs into legislative productivity. We find that higher salaries produce offsetting effects on the quality of politicians. On the one hand, higher salaries disproportionately attract politicians who attended lower ranked schools. But higher salaries also increase the fraction of incumbents who choose to stand for reelection, thus increasing the average tenure (and hence productivity) of politicians. In contrast to these selection effects, monetary incentives have no discernible impact on politicians' effort, which seems more influenced by non-pecuniary motivations.

There are many questions raised by our results. Most obviously, it would be important to know the extent to which our findings would carry over to politicians in other places or other levels of government. Also, it would be instructive to examine the longer-term consequences of the salary change we study here. In particular, the increase in tenure might be a short-run effect that will dissipate as politicians elected prior to the salary change retire. Further research may also allow us to distinguish among explanations for differences in politicians' effort across countries. We find that home country social norms influence attendance and shirking, but we are unable to distinguish whether these norms operate through politicians' internal motivations or through social pressure from the electorate. By carefully considering how the media coverage of scandals affects MEPs' behavior, we might better understand the relative importance of these two channels.

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## Appendix: Components of legislative output

As we mention in Section 2, variable *LegislativeOutput* is based on *Questions*, *Motions for Resolution*, *Reports*, *Written Declarations*, and *Speeches in Plenary* by each MEP. In this Appendix, we provide descriptions of these activities.

- *Questions*. MEPs may submit questions to the European Commission or the European Council. If the question is accepted by the EP president, the Commission or Council must respond either in writing or orally during a plenary. Our data measures the number of times an MEP has posed (or co-posed) such questions.
- *Motions for Resolution*. In the EU, legislation can only be initiated by the European Commission. EP votes on legislation proposed by the Commission and on motions for resolution, which typically outline EP's stance on a particular issue and may call upon the Commission to draft legislation in response. Our measure captures all motions put forth by an MEP.
- *Reports*. A major part of the daily work of EP committees is to prepare reports on different policy issues either by their own initiative or in response to legislation initiated by the Commission. The committee reports are prepared by a "rapporteur" that the relevant committee chooses among its members. Once completed and accepted by the relevant committee, reports are voted on by the entire EP and if passed become adopted texts. Our data measures the number of reports for which the MEP served as the rapporteur.
- *Written Declarations*. MEPs can submit written declarations which, if approved by the EP president, are distributed to all MEPs who may in turn sign them. If a declaration collects signatures from more than half of MEPs within a given time frame, it becomes an adopted text and is published as part of the EP minutes. Our variable measures all submitted declarations.
- *Speeches in Plenary*. During debates, individual MEPs may request speaking time. After a vote, MEPs may also request to explain their vote either orally or by submitting an explanation in writing. Our data measures the number of times an MEP has spoken in plenary (or submitted a written explanation) in this way.



Table 1: Summary Statistics

	Mean	Std. Dev.	Min	Max	Obs.
<u>A. MEP by Year variables</u>					
<i>LegislativeOutput</i>	0.00	3.42	-7.52	13.91	5690
<i>Attendance</i>	0.76	0.25	0.00	1.00	5690
<i>Shirking</i>	0.08	0.09	0.00	1.00	5381
<i>lnTenure</i>	1.45	0.93	0.00	3.47	5690
<i>Age</i>	52.53	10.23	23.00	84.00	5690
<i>Age<sup>2</sup>/100</i>	28.64	10.61	5.29	70.56	5690
<i>lnMediaMentions</i>	2.63	1.99	0.00	8.01	5690
<u>B. MEP by EP variables</u>					
<i>Rerun</i>	0.57	0.50	0.00	1.00	1595
<i>PostVoteQuit</i>	0.11	0.31	0.00	1.00	1595
<i>Reelected</i>	0.70	0.46	0.00	1.00	968
<u>C. EP variables</u>					
<i>TopSchool</i>	0.29	0.46	0.00	1.00	1103
<u>C. Country by EP variables</u>					
<i>lnGDPPC</i>	9.59	0.69	8.41	10.87	50
<i>Corruption</i>	-1.20	0.68	-2.42	-0.55	50
<i>lnNumParties</i>	2.12	0.35	1.10	3.00	50
<u>D. Country variables</u>					
<i>ΔlnSalary</i>	0.74	0.77	-0.45	2.21	25

*LegislativeOutput* is an output measure based on the MEP's activities in the EP (details in the Appendix). *Attendance* is the fraction of days that the MEP participated in roll-call votes. *Shirking* is the fraction of those days when the MEP signed the daily register that (s)he did not participate in roll-call votes. Variables *lnTenure*, *Age*, and *Age<sup>2</sup>/100* are self-explanatory. Variable *lnMediaMentions* is constructed based on the mentions of the MEPs name in the Foreign Language News database maintained by LexisNexis. *Rerun* is an indicator variable for whether the MEP ran for reelection in the previous parliament. *PostVoteQuit* is an indicator variable for whether the MEP quit before completing the previous term. *Reelected* is an indicator variable for whether the MEP (who ran for reelection) won. *TopSchool* is an indicator variable for whether the MEP attended a top-500 undergraduate institution. Variable *lnGDPPC* is the logarithm of GDP per capita, from World Development Indicators. *Corruption* is a measure of corruption from Kaufmann *et al.* (2010). Variable *lnNumParties* is the logarithm of the number of parties who fielded a candidate and won more than 0.5% of the vote. Variable *ΔlnSalary* is a constant (ln92000) minus the logarithm of the MEP's salary as of December 2004.

Table 2: The legislative production function

Dependent variable:	<i>LegislativeOutput</i>			
	(1)	(2)	(3)	(4)
<i>TopSchool</i>	0.557** (0.197)	0.603** (0.200)	0.538** (0.195)	
<i>Attendance</i>	5.319** (0.366)	5.308** (0.384)	5.305** (0.379)	6.052** (0.325)
<i>lnTenure</i>	0.674** (0.091)	0.622** (0.094)	0.787** (0.095)	1.851** (0.197)
<i>Age</i>			0.077 (0.053)	
<i>Age<sup>2</sup>/100</i>			-0.125* (0.051)	
Observations	4,877	4,877	4,877	5,690
R-squared	0.191	0.224	0.249	0.763
Country FE	X			
Year FE	X			
Country by Year FE		X	X	X
MEP FE				X

Robust standard errors in parentheses clustered by MEP. Level of observation is MEP by year. The sample includes observations from EP5, EP6, and the first year of EP7. *LegislativeOutput* is an output measure based on the MEP's activities in the EP (details in the Appendix). *TopSchool* is an indicator variable for whether the MEP attended a top-500 undergraduate institution. *Attendance* is the fraction of days that the MEP participated in roll-call votes. Variables *lnTenure*, *Age*, and *Age<sup>2</sup>/100* are self-explanatory. \*\* p<0.01; \* p<0.05

Table 3: Interpretation of *LegislativeOutput* and the three MEP input measures

Dependent variable:	<i>lnMediaMentions</i>				<i>Reelected</i>		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>LegislativeOutput</i>	0.081** (0.011)	0.085** (0.012)		0.058** (0.009)	0.012** (0.004)	0.020** (0.004)	
<i>TopSchool</i>			0.123 (0.105)				0.130*** (0.031)
<i>lnTenure</i>			0.381** (0.056)				0.089*** (0.027)
<i>Attendance</i>			-0.537* (0.279)				0.207** (0.104)
<i>Age</i>			-0.011 (0.037)				0.005 (0.012)
<i>Age<sup>2</sup>/100</i>			-0.015 (0.037)				-0.007 (0.012)
Observations	5,690	5,690	4,877	5,690	968	968	778
R-squared	0.386	0.403	0.393	0.868	0.103	0.154	0.244
Country FE	X				X		
Year FE	X				X		
Country by Year FE		X	X	X			
Country by EP FE						X	X
MEP FE				X			

Robust standard errors in parentheses clustered by MEP. Level of observation is MEP by year in Columns (1)-(4) and MEP by EP in Columns (5)-(7). Variable *lnMediaMentions* is constructed based on the mentions of the MEPs name in the Foreign Language News database maintained by LexisNexis. The sample in Columns (5)-(7) consists only of those MEPs who ran for reelection. *Reelected* is an indicator variable for whether the MEP was reelected. *LegislativeOutput* is an output measure based on the MEP's activities in the EP (details in the Appendix). *TopSchool* is an indicator variable for whether the MEP attended a top-500 undergraduate institution. Variables *lnTenure*, *Age*, and *Age<sup>2</sup>/100* are self-explanatory. \*\* p<0.01; \* p<0.05

Table 4: Annual salaries and number of MEPs by country and year

Country	Annual Salary (€)		Number of MEPs		
	by year		by year		
	1999	2004	1999	2004	2007
Austria	101,640	106,583	21	18	17
Belgium	67,188	72,018	25	24	22
Cyprus		52,041		6	6
Czech Republic		19,774		24	22
Denmark	59,004	69,816	16	14	13
Estonia		21,864		6	6
Finland	39,600	59,640	16	14	13
France	64,308	81,273	87	78	72
Germany	75,696	84,108	99	99	99
Greece	59,244	73,850	25	24	22
Hungary		10,080		24	22
Ireland	47,712	83,712	15	13	12
Italy	115,620	144,084	87	78	72
Latvia		12,518		9	8
Lithuania		14,197		13	12
Luxembourg	49,452	63,791	6	6	6
Malta		15,534		5	5
Netherlands	62,076	86,126	31	27	25
Poland		28,860		54	50
Portugal	42,816	48,286	25	24	22
Slovakia		14,085		14	13
Slovenia		48,815		7	7
Spain	33,936	38,396	64	54	50
Sweden	38,772	62,069	22	19	18
UK	64,344	83,312	87	78	72

Annual pre-tax salary in nominal € Source: Corbett et al. (2000,2005).

Table 5: Impact of salary change on MEPs' willingness to hold office

Dependent variable:	<i>Rerun</i>			<i>PostVoteQuit</i>		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>EP7*ΔlnSalary</i>	0.299** (0.025)	0.314** (0.046)	0.326** (0.040)	-0.028 (0.039)	-0.095* (0.037)	-0.112** (0.029)
<i>lnGDPPC</i>		-0.162 (0.288)	0.064 (0.270)		0.578* (0.214)	0.456* (0.192)
<i>Corruption</i>		0.169 (0.102)	0.195* (0.091)		0.399** (0.099)	0.365** (0.094)
<i>lnTenure</i>			-0.044 (0.027)			0.047** (0.013)
<i>Age</i>			0.041** (0.010)			-0.007 (0.007)
<i>Age<sup>2</sup>/100</i>			-0.044** (0.010)			0.004 (0.007)
Observations	1,595	1,595	1,595	1,595	1,595	1,595
R-squared	0.091	0.092	0.123	0.054	0.066	0.078

Robust standard errors in parentheses clustered by country. All specifications include country and EP fixed effects. Level of observation is MEP by EP. Sample consists of all MEPs who served in EP5 and those MEPs who served in EP6 and joined the parliament prior to the announcement of the salary change. *Rerun* is an indicator variable for whether the MEP ran for reelection in the previous parliament. *PostVoteQuit* is an indicator variable for whether the MEP quit before completing the previous term. *EP7* is an indicator variable for whether  $p=7$ . Variable  $\Delta \ln \text{Salary}$  is a constant ( $\ln 92000$ ) minus the logarithm of the MEP's salary as of December 2004. Variable *lnGDPPC* is the logarithm of GDP per capita, from World Development Indicators. *Corruption* is a measure of corruption from Kaufmann *et al.* (2010). Variables *lnTenure*, *Age*, and *Age<sup>2</sup>/100* are self-explanatory. \*\*  $p < 0.01$ ; \*  $p < 0.05$

Table 6: Impact of salary change on the composition of MEPs

Dependent variable:	<i>InTenure</i>		<i>TopSchool</i>			
	(1)	(2)	(3)	(4)	(4)	(4)
<i>EP7*ΔlnSalary</i>	0.241** (0.042)	0.261** (0.076)	-0.063** (0.016)	-0.065** (0.019)	-0.115** (0.046)	-0.039 (0.019)
<i>lnGDPPC</i>		-2.637* (1.113)		-0.304 (0.317)	-0.062 (1.014)	-0.490 (0.805)
<i>Corruption</i>		-0.846 (0.454)		-0.180 (0.166)	-0.340 (0.293)	-0.041 (0.337)
Observations	1,526	1,526	1,352	1,352	674	678
R-squared	0.152	0.157	0.175	0.176	0.165	0.222
Sample					Non-Freshmen	Freshmen

Robust standard errors in parentheses clustered by country. All specifications include country and EP fixed effects. Level of observation is MEP by EP. Sample consists of all MEPs who served in EP6 and EP7. Variable *InTenure* is self-explanatory. *TopSchool* is an indicator variable for whether the MEP attended a top-500 undergraduate institution. *EP7* is an indicator variable for whether  $p=7$ . Variable *ΔlnSalary* is a constant (ln92000) minus the logarithm of the MEP's salary as of December 2004. Variable *lnGDPPC* is the logarithm of GDP per capita, from World Development Indicators. *Corruption* is a measure of corruption from Kaufmann *et al.* (2010). \*\*  $p < 0.01$ ; \*  $p < 0.05$

Table 7: Selection effects due to the differential sensitivity of MEPs to salary change

Dependent variable:	<i>Rerun</i>					
	(1)	(2)	(3)	(4)	(5)	(6)
<i>EP7*ΔlnSalary</i>	0.120** (0.037)	-0.014 (0.071)	0.321** (0.054)	0.331** (0.072)	0.284** (0.085)	0.301** (0.063)
<i>lnGDPPC</i>	0.062 (0.300)	-0.591 (0.888)	-0.252 (0.330)	-3.094 (2.408)	-0.015 (0.507)	-0.694 (2.457)
<i>Corruption</i>	0.158 (0.114)	0.359 (0.407)	0.231 (0.157)	-0.180 (0.241)	0.056 (0.212)	0.274 (0.244)
Observations	679	279	1,061	534	887	708
R-squared	0.209	0.237	0.113	0.140	0.095	0.111
Sample	<i>TopSchool</i> = 0	<i>TopSchool</i> = 1	<i>Tenure</i> ≤ median	<i>Tenure</i> > median	<i>Attendance</i> ≤ median	<i>Attendance</i> > median

Robust standard errors in parentheses clustered by country. All specifications include country and EP fixed effects. Level of observation is MEP by EP. Sample consists of all MEPs who served in EP5 and those MEPs who served in EP6 and joined the parliament prior to the announcement of the salary change. *Rerun* is an indicator variable for whether the MEP ran for reelection in the previous parliament. *EP7* is an indicator variable for whether  $p=7$ . Variable *ΔlnSalary* is a constant ( $\ln 92000$ ) minus the logarithm of the MEP's salary as of December 2004. Variable *lnGDPPC* is the logarithm of GDP per capita, from World Development Indicators. *Corruption* is a measure of corruption from Kaufmann *et al.* (2010). \*\*  $p < 0.01$ ; \*  $p < 0.05$

Table 8: Impact of salary change on MEPs' effort

Dependent variable:	<i>Attendance</i>			
	(1)	(2)	(3)	(4)
<i>ΔlnSalary</i>	0.019 (0.045)			
<i>EP7*ΔlnSalary</i>	-0.049 (0.039)	0.006 (0.025)	0.011 (0.024)	0.008 (0.035)
<i>lnGDPPC</i>	-0.063 (0.051)	-0.701** (0.236)	-0.689** (0.234)	-0.458 (0.273)
<i>Corruption</i>	-0.068** (0.021)	0.048 (0.094)	0.049 (0.094)	-0.038 (0.143)
<i>lnTenure</i>			-0.013* (0.005)	0.014 (0.028)
<i>Age</i>			0.006 (0.003)	-0.009 (0.027)
<i>Age<sup>2</sup>/100</i>			-0.006 (0.003)	0.002 (0.025)
Observations	1,443	1,443	1,443	636
R-squared	0.036	0.096	0.103	0.608
Country FE		X	X	X
EP FE	X	X	X	X
MEP FE				X

Robust standard errors in parentheses clustered by country. Level of observation is MEP by EP. All variables are measured during the first year of each parliament to ensure that we are comparing behaviors in the same part of the electoral cycle. Column (4), since it includes MEP fixed effects, limits the sample to those MEPs who were present in both EP6 and EP7. *Attendance* is the fraction of days that the MEP participated in roll-call votes. Variable *ΔlnSalary* is a constant (ln92000) minus the logarithm of the MEP's salary as of December 2004. *EP7* is an indicator variable for whether  $p=7$ . Variable *lnGDPPC* is the logarithm of GDP per capita, from World Development Indicators. *Corruption* is a measure of corruption from Kaufmann *et al.* (2010). Variables *lnTenure*, *Age*, and *Age<sup>2</sup>/100* are self-explanatory. \*\*  $p < 0.01$ ; \*  $p < 0.05$



Table 9: Impact of salary change on MEPs' shirking

Dependent variable:	<i>Shirking</i>			
	(1)	(2)	(3)	(4)
<i>ΔlnSalary</i>	-0.013 (0.017)			
<i>EP7*ΔlnSalary</i>	0.025 (0.020)	-0.004 (0.012)	-0.006 (0.012)	-0.012 (0.018)
<i>lnGDPPC</i>	0.004 (0.021)	0.340** (0.103)	0.342** (0.101)	0.260 (0.144)
<i>Corruption</i>	0.022* (0.009)	-0.034 (0.039)	-0.034 (0.038)	0.006 (0.068)
<i>lnTenure</i>			0.002 (0.003)	-0.008 (0.013)
<i>Age</i>			0.002 (0.002)	0.004 (0.012)
<i>Age<sup>2</sup>/100</i>			-0.002 (0.001)	0.003 (0.009)
Observations	1,421	1,421	1,421	630
R-squared	0.035	0.095	0.100	0.660
Country FE		X	X	X
EP FE	X	X	X	X
MEP FE				X

Robust standard errors in parentheses clustered by country. Level of observation is MEP by EP. All variables are measured during the first year of each parliament to ensure that we are comparing behaviors in the same part of the electoral cycle. Column (4), since it includes MEP fixed effects, limits the sample to those MEPs who were present in both EP6 and EP7. *Shirking* is the fraction of those days when the MEP signed the daily register that (s)he did not participate in roll-call votes. Variable *ΔlnSalary* is a constant (ln92000) minus the logarithm of the MEP's salary as of December 2004. *EP7* is an indicator variable for whether  $p=7$ . Variable *lnGDPPC* is the logarithm of GDP per capita, from World Development Indicators. *Corruption* is a measure of corruption from Kaufmann *et al.* (2010). Variables *lnTenure*, *Age*, and *Age<sup>2</sup>/100* are self-explanatory. \*\*  $p < 0.01$ ; \*  $p < 0.05$

Table 10: Role of social norms in effort

Dependent variable:	<i>Attendance</i>				<i>Shirking</i>			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Corruption</i>	-0.066* (0.030)	-0.121** (0.029)	-0.125** (0.029)	-0.058 (0.058)	0.036* (0.013)	0.067** (0.009)	0.068** (0.009)	0.036 (0.022)
<i>lnGDPPC</i>		-0.088* (0.032)	-0.084* (0.031)	-0.401** (0.127)		0.049** (0.008)	0.047** (0.008)	0.296* (0.135)
<i>lnTenure</i>			-0.021** (0.006)	-0.028** (0.004)			0.007 (0.004)	0.007 (0.004)
<i>Age</i>			0.009* (0.004)	0.007 (0.004)			0.000 (0.001)	0.000 (0.001)
<i>Age<sup>2</sup>/100</i>			0.000 (0.000)	0.000 (0.000)			0.000 (0.000)	0.000 (0.000)
Observations	11,377	11,377	11,377	11,377	10,657	10,657	10,657	10,657
R-squared	0.127	0.143	0.148	0.193	0.141	0.162	0.164	0.194
Year FE	X	X	X	X	X	X	X	X
Country FE				X				X

Robust standard errors in parentheses clustered by country. Level of observation is MEP by year. *Attendance* is the fraction of days that the MEP participated in roll-call votes. *Shirking* is the fraction of those days when the MEP signed the daily register that (s)he did not participate in roll-call votes. *Corruption* is a measure of corruption from Kaufmann *et al.* (2010). Variable *lnGDPPC* is the logarithm of GDP per capita, from World Development Indicators. Variables *lnTenure*, *Age*, and *Age<sup>2</sup>/100* are self-explanatory.

\*\* p<0.01; \* p<0.05

Table 11: The reduced form impact of salary on legislative output

Dependent variable:	<i>LegislativeOutput</i>		
	(1)	(2)	(3)
<i>EP7*ΔlnSalary</i>	0.628 (0.367)	0.376 (0.338)	0.267 (0.329)
<i>lnGDPPC</i>		4.333 (3.709)	4.351 (3.460)
<i>Corruption</i>		0.817 (1.073)	0.527 (0.923)
<i>lnTenure</i>			0.587** (0.103)
<i>TopSchool</i>			0.550* (0.248)
Observations	1,443	1,443	1,287
R-squared	0.105	0.107	0.154

Robust standard errors in parentheses clustered by country. All specifications include country and EP fixed effects. Level of observation is MEP by EP. All variables are measured during the first year of each parliament to ensure that we are comparing behaviors in the same part of the electoral cycle. *LegislativeOutput* is an output measure based on the MEP's activities in the EP (details in the Appendix). Variable  $\Delta \ln Salary$  is a constant ( $\ln 92000$ ) minus the logarithm of the MEP's salary as of December 2004. *EP7* is an indicator variable for whether  $p=7$ . Variable *lnGDPPC* is the logarithm of GDP per capita, from World Development Indicators. *Corruption* is a measure of corruption from Kaufmann *et al.* (2010). Variable *lnTenure* is self-explanatory. *TopSchool* is an indicator variable for whether the MEP attended a top-500 undergraduate institution. \*\*  $p < 0.01$ ; \*  $p < 0.05$

Table 12: Impact of salary on the supply of political parties

Dependent variable:	<i>InNumParties</i>	
	(1)	(2)
<i>EP7*ΔlnSalary</i>	0.155 (0.089)	0.217* (0.104)
<i>lnGDPPC</i>		-0.721 (1.036)
<i>Corruption</i>		-0.165 (0.407)
Observations	50	50
R-squared	0.913	0.919

Robust standard errors in parentheses clustered by country. All specifications include country and EP fixed effects. Level of observation is country by EP. Variable *InNumParties* is the logarithm of the number of parties who fielded a candidate and won more than 0.5% of the vote. Variable *ΔlnSalary* is a constant ( $\ln 92000$ ) minus the logarithm of the MEP's salary as of December 2004. *EP7* is an indicator variable for whether  $p=7$ . Variable *lnGDPPC* is the logarithm of GDP per capita, from World Development Indicators. *Corruption* is a measure of corruption from Kaufmann *et al.* (2010). \*\*  $p < 0.01$ ; \*  $p < 0.05$

Table 13: MEPs' votes on salary harmonization

Dependent variable:	<i>VotedForSalaryChange</i>		
	(1)	(2)	(3)
<i>ΔlnSalary</i>	-0.003 (0.058)	0.116 (0.058)	0.112 (0.122)
<i>lnGDPPC</i>		0.191 (0.195)	0.197 (0.192)
<i>Corruption</i>		0.059 (0.142)	0.055 (0.136)
<i>lnTenure</i>			-0.016 (0.025)
<i>Age</i>			0.002 (0.015)
<i>Age<sup>2</sup>/100</i>			0.000 (0.000)
Observations	755	755	755
R-squared	0.000	0.006	0.008

Robust standard errors in parentheses clustered by country. Level of observation is MEP. *VotedForSalaryChange* is an indicator variable for whether the MEP voted in support of salary harmonization. Variable *ΔlnSalary* is a constant (ln92000) minus the logarithm of the MEP's salary as of December 2004. Variable *lnGDPPC* is the logarithm of GDP per capita, from World Development Indicators. *Corruption* is a measure of corruption from Kaufmann *et al.* (2010). Variables *lnTenure*, *Age*, and *Age<sup>2</sup>/100* are self-explanatory. \*\* p<0.01; \* p<0.05

Table 14: Robustness tests

PANEL A – EP 6 and EP 7 – Results for countries in EU prior to 2004					
Dependent variable:	<i>PostVoteQuit</i>	<i>lnTenure</i>	<i>TopSchool</i>	<i>Attendance</i>	<i>Shirking</i>
	(1)	(2)	(3)	(3)	(4)
<i>EP7*ΔlnSalary</i>	-0.162*** (0.0352)	0.330*** (0.0958)	-0.143** (0.0599)	-0.0352 (0.0288)	0.00430 (0.0159)
<i>lnGDPPC</i>	1.087 (0.711)	-9.894** (3.610)	-0.452 (0.774)	-1.733*** (0.292)	0.771*** (0.129)
<i>Corruption</i>	0.411*** (0.109)	-0.912 (0.803)	-0.267 (0.199)	0.00780 (0.0515)	-0.0116 (0.0233)
Observations	1,273	1,195	1,045	1,123	1,105
R-squared	0.057	0.137	0.158	0.111	0.112

PANEL B – EP 6 and EP 7 – Percent change in salary					
Dependent variable:	<i>PostVoteQuit</i>	<i>lnTenure</i>	<i>TopSchool</i>	<i>Attendance</i>	<i>Shirking</i>
	(1)	(2)	(3)	(3)	(4)
<i>EP7*Δ%Salary</i>	-0.0159* (0.00921)	0.0787*** (0.0233)	-0.0168*** (0.00521)	0.00500 (0.00790)	-0.00221 (0.00368)
<i>lnGDPPC</i>	0.267 (0.214)	-2.186** (1.057)	-0.438 (0.325)	-0.745*** (0.240)	0.352*** (0.0997)
<i>Corruption</i>	0.432*** (0.147)	-1.039** (0.477)	-0.131 (0.171)	0.0404 (0.0957)	-0.0314 (0.0399)
Observations	1,595	1,526	1,352	1,443	1,421
R-squared	0.063	0.156	0.175	0.096	0.095

PANEL C – EP 5 and EP 6 –Placebo tests

Dependent variable:	<i>PostVoteQuit</i>	<i>lnTenure</i>	<i>Attendance</i>	<i>Shirking</i>
	(1)	(2)	(3)	(4)
<i>EP6*ΔlnSalary</i>	0.0510 (0.060)	-0.278 (0.185)	-0.003 (0.020)	0.043*** (0.013)
<i>lnGDPPC</i>	4.951*** (1.302)	-3.082 (2.725)	-0.111 (0.236)	0.022 (0.120)
<i>Corruption</i>	-0.885** (0.329)	-0.267 (0.832)	-0.128 (0.078)	0.060 (0.040)
Observations	1,427	1,244	1,244	1,212
R-squared	0.077	0.078	0.228	0.138

In all panels, robust standard errors in parentheses clustered by country. In Panels A and B, the data are drawn from EP6 and EP7, while Panel C uses data from EP5 and EP6. Panel A limits the sample to MEPs from countries that had entered the European Union prior to the 2004 expansion. All specifications in all panels include country and EP fixed effects, and level of observation is country by EP. *PostVoteQuit* is an indicator variable for whether the MEP quit before completing the previous term. *TopSchool* is an indicator variable for whether the MEP attended a top-500 undergraduate institution. *Attendance* is the fraction of days that the MEP participated in roll-call votes. *Shirking* is the fraction of those days when the MEP signed the daily register that (s)he did not participate in roll-call votes. *EP7* (*EP6*) is an indicator variable for whether *p=7* (*6*). *ΔlnSalary* is a constant ( $\ln 92000$ ) minus the logarithm of the MEP's salary as of December 2004, and *Δ%Salary* is the MEP's salary as of December 2004 minus 92000 divided by the December 2004 salary. *Corruption* is a measure of corruption from Kaufmann *et al.* (2010). Variable *lnGDPPC* is the logarithm of GDP per capita, from World Development Indicators. *lnTenure* is self-explanatory. \*\*  $p < 0.01$ ; \*  $p < 0.05$

Appendix Table A1: The effect of salary change for high versus low corruption countries

Dependent variable:	<i>lnTenure</i>	<i>TopSchool</i>	<i>Attendance</i>	<i>Shirking</i>
	(1)	(2)	(3)	(4)
<i>EP7*ΔlnSalary</i>	0.0340 (0.304)	-0.130** (0.0532)	0.0257 (0.0815)	0.0727 (0.0500)
<i>lnGDPPC</i>	-2.728** (1.223)	-0.283 (0.327)	-0.931*** (0.322)	0.239 (0.204)
<i>Corruption</i>	-1.813 (1.364)	-0.444* (0.227)	0.0331 (0.108)	0.0547 (0.0429)
<i>EP7*Corruption</i>	0.245 (0.178)	0.0609* (0.0340)	0.0318 (0.0421)	-0.0460** (0.0194)
<i>Corruption*ΔlnSalary</i>	1.104 (1.545)	0.352 (0.210)	-0.194 (0.148)	-0.0972 (0.0851)
<i>EP7*Corruption*ΔlnSalary</i>	-0.0282 (0.221)	-0.00258 (0.0743)	-0.0595 (0.0581)	0.0711** (0.0333)
Observations	1,526	1,352	1,443	1,421
R-squared	0.161	0.177	0.107	0.107

Robust standard errors in parentheses clustered by country. All specifications include country and EP fixed effects. Level of observation is country by EP. *TopSchool* is an indicator variable for whether the MEP attended a top-500 undergraduate institution. *Attendance* is the fraction of days that the MEP participated in roll-call votes. *Shirking* is the fraction of those days when the MEP signed the daily register that (s)he did not participate in roll-call votes. *Corruption* is a measure of corruption from Kaufmann *et al.* (2010). Variable *lnGDPPC* is the logarithm of GDP per capita, from World Development Indicators. *lnTenure* is self-explanatory. \*\* p<0.01; \* p<0.05

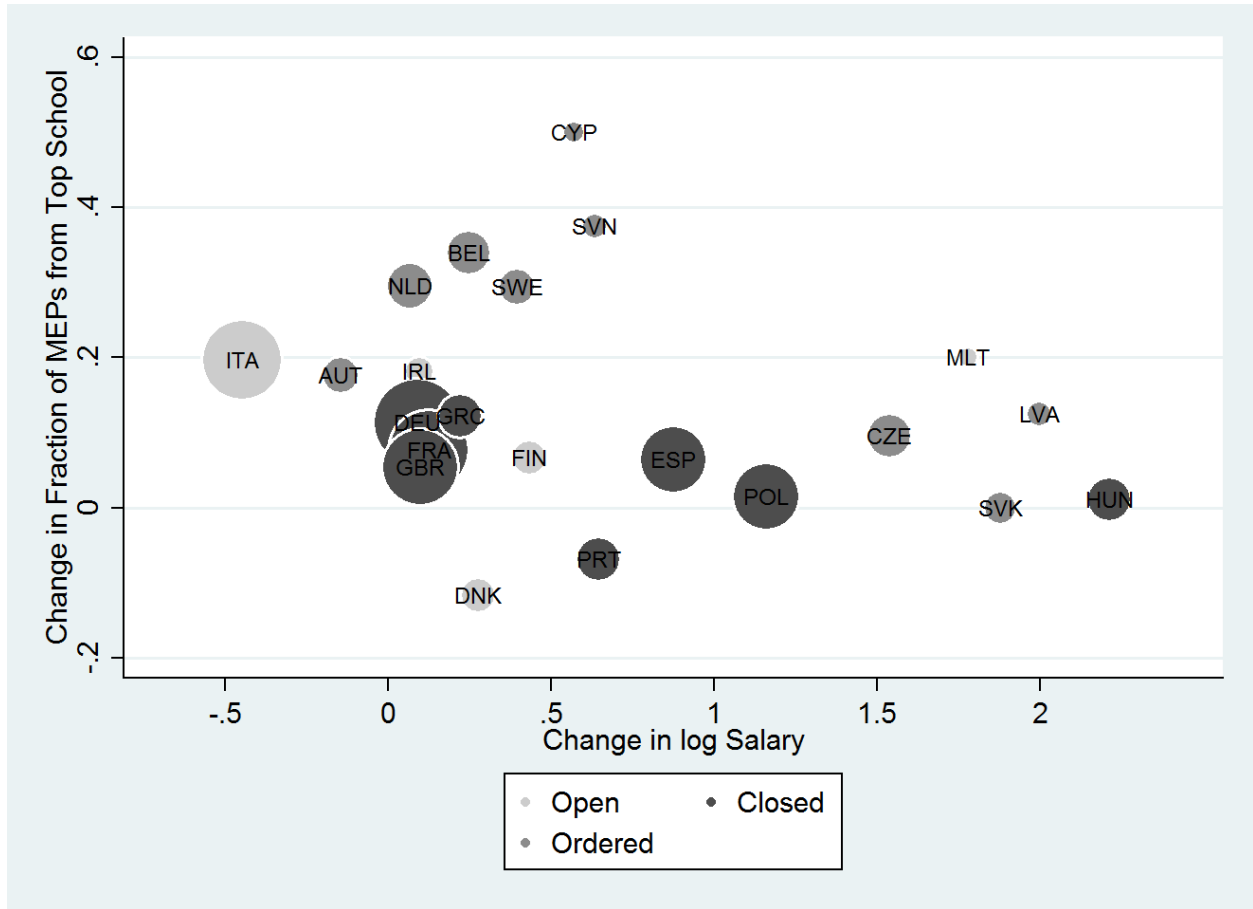


Figure 1: The impact of salary change on MEPs' willingness to run for reelection



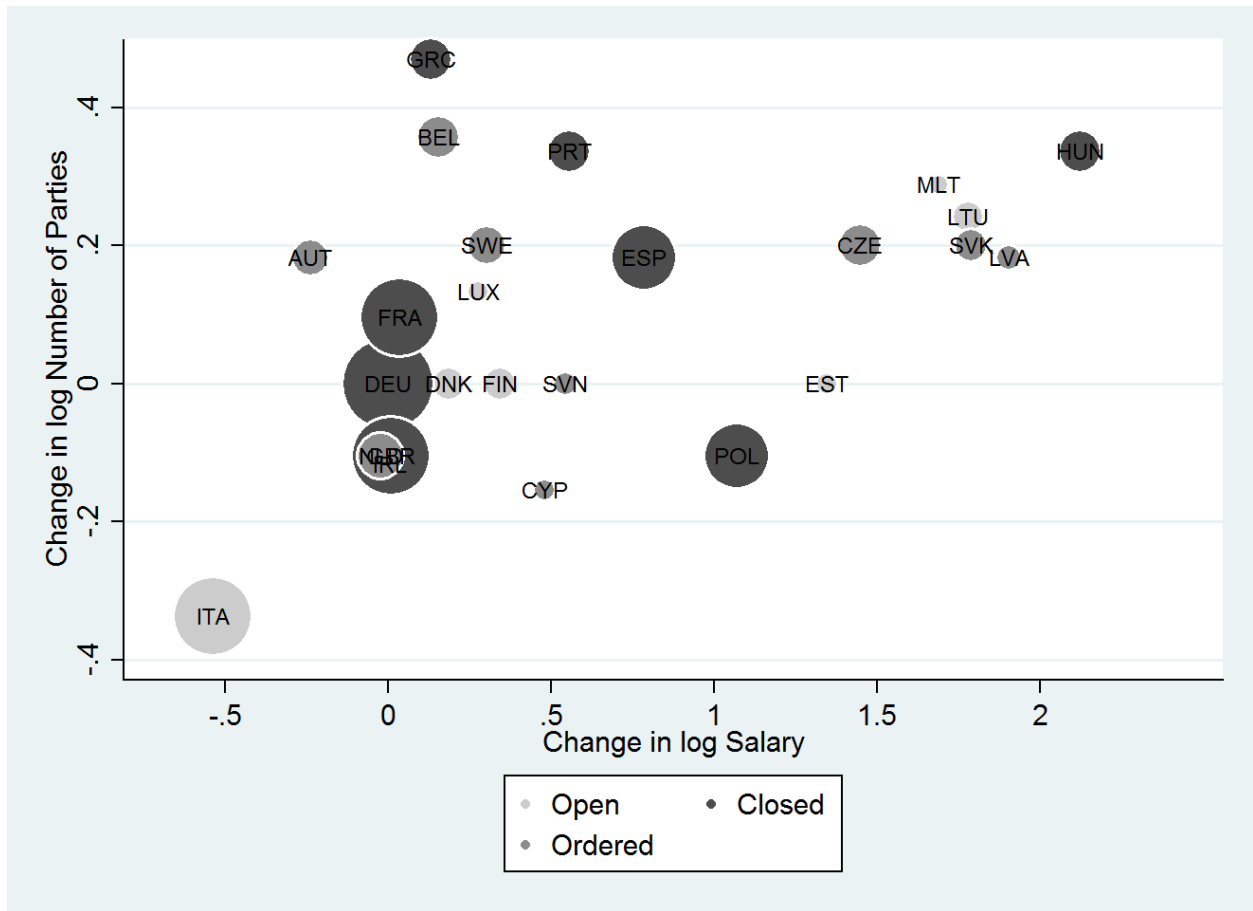
Closed, ordered, and open refer to the type of electoral system. The size of the circles is proportional to the number of MEPs from the country. Countries are labeled with their ISO codes: Austria (AUT), Belgium (BEL), Cyprus (CYP), Czech Republic (CZE), Denmark (DNK), Estonia (EST), Finland (FIN), France (FRA), Germany (DEU), Greece (GRC), Hungary (HUN), Ireland (IRL), Italy (ITA), Latvia (LVA), Lithuania (LTU), Luxembourg (LUX), Malta (MLT), Netherlands (NLD), Poland (POL), Portugal (PRT), Slovakia (SVK), Slovenia (SVN), Spain (ESP), Sweden (SWE), and United Kingdom (GBR).

Figure 2: Impact of salary change on the composition of MEPs



Closed, ordered, and open refer to the type of electoral system. The size of the circles is proportional to the number of MEPs from the country. Countries are labeled with their ISO codes: Austria (AUT), Belgium (BEL), Cyprus (CYP), Czech Republic (CZE), Denmark (DNK), Estonia (EST), Finland (FIN), France (FRA), Germany (DEU), Greece (GRC), Hungary (HUN), Ireland (IRL), Italy (ITA), Latvia (LVA), Lithuania (LTU), Luxembourg (LUX), Malta (MLT), Netherlands (NLD), Poland (POL), Portugal (PRT), Slovakia (SVK), Slovenia (SVN), Spain (ESP), Sweden (SWE), and United Kingdom (GBR).

Figure 3: Impact of salary change on the supply of political parties



Closed, ordered, and open refer to the type of electoral system. The size of the circles is proportional to the number of MEPs from the country. Countries are labeled with their ISO codes: Austria (AUT), Belgium (BEL), Cyprus (CYP), Czech Republic (CZE), Denmark (DNK), Estonia (EST), Finland (FIN), France (FRA), Germany (DEU), Greece (GRC), Hungary (HUN), Ireland (IRL), Italy (ITA), Latvia (LVA), Lithuania (LTU), Luxembourg (LUX), Malta (MLT), Netherlands (NLD), Poland (POL), Portugal (PRT), Slovakia (SVK), Slovenia (SVN), Spain (ESP), Sweden (SWE), and United Kingdom (GBR).