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Shirk or Work? On How Legislators React to Monitoring

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Shirk or Work? On How Legislators React to Monitoring ¹

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Abstract

Does transparency affect the decision to shirk or work? The question is analyzed using the example of parliamentary voting. Without transparency, politicians have little incentive to attend all votes in parliament. But if voters have means to monitor their representatives' effort, incumbents face the trade-off between shirking and deteriorating reelection prospects the more votes they miss.

A 2014 institutional change in the Swiss Upper House allows testing the theoretical prediction. The introduction of an electronic voting system involved individual decisions on several types of votes to be automatically published whereas all other votes remained secret to the public. Pre- and post-reform attendance during secret votes comes from video recordings of all sessions. This variation in monitoring depending exogenously on vote types allows identifying a causal effect of monitoring on shirking measured by attendance.

Legislators shirk less once attendance is monitored. The effect is particularly strong among politicians for whom reelection is most valuable: incumbents aspiring for another term, full-time politicians who devoted themselves to a career in parliament, and legislators with few interest groups.

Keywords

Shirking; Absence; Monitoring; Transparency; Parliament; Legislators; Accountability

JEL Classification

D72, P16

1 Introduction

Voting and absenteeism during parliamentary sessions are the legislative analogues to working and shirking. Voting in parliament belongs to the legislators' duties and requires their presence in the chamber.¹ However, when the media display pictures of half-empty assemblies this violates the "ideal" picture of the dutiful member of parliament. Attempts to count presence during legislative sessions document politicians missing considerable shares of votes: a third of all votes in Italy (Gagliarducci, Nannicini & Naticchioni 2010), 31% in the UK House of Commons (Besley & Larcinese 2011), and 8% in the German Bundestag (Arnold, Kauder & Potrafke 2014).

By democratic design, the electoral connection between voters and representatives is characterized as a principal-agent relationship (Besley 2006). Legislators are thought of as accountable to their electorate (Persson & Tabellini 2000). The form of accountability considered in this paper is presence in parliament and *participatory shirking* defines departures from it (Rothenberg & Sanders 2000).²

Attendance rates are calculated from official voting records. Whether participatory shirking can be detected thus hinges upon absences being recorded and readily accessible. If voting records are publicly unavailable and parliamentary minutes undisclosed, there is no way of controlling the legislators' behavior. Regulation regarding transparency of legislators' behavior varies strongly by assembly (Hug 2010; Hug, Wegmann & Wüest 2015): 25% of 92 parliaments are completely nontransparent, while all voting records are public in 22% of the assemblies and the remainder publishes votes with some restrictions.

I address the question whether the possibility to track legislators' presence during voting sessions impacts their dutifulness or effort measured by attendance rates. Absenteeism can be either *excused* for an entire day or *selective*: though legislators appear at the beginning of a meeting, they leave their seats during debates and speeches only to return for some of the votes. In the meantime, they use their time for communication with interest groups, work unrelated to politics or leisure.

Intuitively, if legislators cannot be detected while shirking, they have little incentive to attend all voting sessions. They will resort to participating in the most important votes but leave out less crucial ones. But if voters have the means to find out about politicians not fulfilling their representative duties, it is possible to punish shirking legislators. E.g., low attendance rates can be negatively publicized by the press and ultimately, voters might choose not to reelect politicians who put little effort into their representative function. This rationale is particularly appealing in settings allowing for earning non-political rents. Examples are the pursuit of a non-political occupation, or fostering relationships with interest groups. Both might offer more attractive rents than participating in votes either in the short run or with the view to a post-political career.

In my model, I capture this intuition. Politicians allocate their time between doing political

¹ Though political work also happens in committees outside the chamber, a member of parliament absent during a vote cannot fulfill his representative duty.

² Accountability or shirking can take many forms. Legislators are thought of as representing electoral preferences. Violating the electoral connection by voting against constituency interest is known as *ideological shirking*.

work in the chamber or shirking to earn non-political rents. Voters decide whether to reelect incumbents for a second term or replace them with a new politician. Legislators face the trade-off between shirking during the first term and getting reelected for a second one. The model shows that while legislators with low non-political rents never shirk, attendance of legislators with high opportunity costs of doing politics depends on monitoring. In theory better monitoring leads to more attendance on average. Part of the high-ability politicians optimally devote their time to work during their first term to secure reelection. Top-ability types, in contrast, have such high opportunity costs that they prefer shirking in the first term even though they are not getting reelected for this. On average, the model predicts lower absence rates as a consequence of vote transparency. The effect should be small when legislators face their last term.

My model combines elements of the moonlighting model by Gagliarducci, Nannicini and Naticchioni (2010) and Besley's (2004) optimal political wage model. Gagliarducci, Nannicini and Naticchioni (2010) extend the candidate selection literature (Caselli & Morelli 2004) by explicitly allowing for earning ability-dependent wages in the private sector while holding a seat in parliament. The main difference to their model lies in the modeling of attendance monitoring and how that affects the electoral connection via reelection probabilities. In that my model spans over two political terms and thus one reelection decision, it shares similarities with Besley (2004) who was mainly concerned with the effect of political salaries on implementing policies desirable to the electorate.

I test the model predictions suggesting that legislators adjust their vote attendance depending on the monitoring technology at the hands of their constituencies. I exploit an institutional change in the voting procedure of the Swiss Upper House, the *Ständerat*, which enhanced monitoring of legislators for several legally defined types of votes but kept transparency constant for the remaining ones. Before 2014 members of the Swiss Upper House voted exclusively by show of hands. The possibility of recorded votes on request was virtually never made use of. Though all sessions were video recorded, neither the media nor researchers have undertaken the effort of finding out about attendance rates in this chamber.³

Beginning in 2014, all votes in the Upper House are taken electronically. Individual decisions on several types of votes - emergency votes, debt brakes, ensemble votes, and final passage votes - are automatically published online in pdf format. Monitoring legislators' attendance has consequently been facilitated for these vote types. Indeed, the independent policy platform *Politnetz* started publishing attendance rates of the Upper House on their webpage. In contrast and importantly for this paper, the remaining vote types stay undisclosed to the public and are concealed from the eyes of the voters. Comparing the two types of votes before and after the change in voting rules allows estimating a causal effect of monitoring on attendance rates during parliamentary voting sessions using a difference-in-difference estimator.

Since the change occurred in the middle of the 2011-2015 legislative period, the parliament's

³ In contrast, the Swiss media report on attendance rates in the Lower House which takes all votes electronically and is consequently easily traceable.

composition remained largely unchanged. It is therefore possible to compare the same politicians voting under exogenously varying monitoring technologies while shutting down candidate-selection motifs. Moreover, the Swiss setting is ideal to test the model because Swiss Members of Parliament are allowed to hold an occupation next to their position in parliament, and are affiliated with many interest groups.

The results confirm the theoretical expectations: the probability of being absent decreases from initial levels of 19% by 3 percentage points if attendance is monitored. Legislators are more likely to vote if shirking can be detected. The effects are particularly strong for subgroups of politicians theoretically expected to be more accountable to their electorate. Legislators standing for reelection shirk less but retiring politicians are not affected by the change in monitoring. Full-time politicians reduce their absences considerably, whereas no effect can be found for legislators with outside occupations. Career politicians are dependent on reelection due to lack of alternative careers and may thus react more responsive to monitoring. Legislators simultaneously employed in the private sector, in contrast, have better outside options if their political mandate is terminated. Moreover, I find that legislators with only few interest groups reduce their absences significantly more than legislators with many interest groups. A potential interpretation is that interest groups as insiders to the political process have been more able to monitor “their” legislators even without recorded voting. In contrast, legislators with few interest groups feel a stronger effect of monitoring.

This paper extends the literature dealing with effects of transparency on legislative behavior. It contributes to a better understanding of whether and how monitoring and observability affect the way individuals behave (e.g., Benesch, Büttler and Hofer 2015; Fox 2007; Grossman and Hanlon 2014; Prat 2005). Its main contribution is to exploit exogenous variation in the regulation regarding recorded voting according to vote types and over time which allows estimating a causal effect.

The relevance of the results extends beyond the field of political economy towards areas in which transparency plays a role. Examples are among others labor economics and the setting of optimal wages (e.g., Barmby, Sessions & Treble 1994; Shapiro & Stiglitz 1984), or the communication of monetary policy decision-making processes (Gersbach & Hahn 2004, 2008).

The literature is reviewed and related to this paper in Section 2. Section 3 presents the theoretical model. The institutional setup and description of the data are in Section 4. The identification strategy is explained in Section 5. Results are reported in Section 6. Section 7 concludes.

2 Related Literature

Politicians are elected representatives of their constituencies. Empowered by their voters, they are thought of as accountable to their electorate in the spirit of a principal-agent relationship (Besley 2004). This paper relates to literature on legislative accountability in general, and the role of transparency.⁴

⁴ Bender and Lott (1996) provide literature review concerning the early foundations of this literature.

The principal-agent (or voter-legislator) relationship can be viewed from the angle of moral hazard or adverse selection. The role of transparency on moral hazard has been studied in a number of contributions. In Holmström's (1979) seminal contribution principals benefit from more information on their agents' actions. A more recent strand of the literature emphasizes potentially adverse effects of transparency (e.g., Gersbach & Hahn 2004; Prat 2005). Most research focuses on the quality of outcomes resulting from public and secret voting (Mattozzi & Nakaguma 2016).

Closely to this paper, Benesch, Büttler and Hofer (2015) focus on a different aspect of the same introduction of electronic voting in the Swiss Upper House as in this paper. Concentrating on final passage votes, they investigate how transparency impacts party loyalty. They find more voting in accordance with party lines once individual voting decisions become observable.

Other research is concerned with the effort invested in decision-making. Gersbach and Hahn (2012) show that transparency benefits the principal through better outcomes induced by the agent's higher effort levels.

Adverse selection in agency models is at the heart of some candidate selection model. Rents from being a politician determine whether a citizen becomes a candidate or not. Caselli and Morellis' (2004) model predicts low-quality politicians because only those with low potential wages on the private market find it lucrative to earn political wages (. Gagliarducci, Nannicini and Naticchioni (2010) model legislators who additionally earn wages outside their political occupation, i.e., they moonlight. The authors provide evidence for their model mechanisms predicting high-ability candidates (as they can continue working on the private market), who, however, put less effort (in terms of floor voting) into their political mandate as a consequence of other activities. Fedele and Naticchioni (2015) distinguish between ability and motivation such that citizens fitting well into public occupation receive higher intrinsic rewards from following such a profession. Data from Italy support their model showing that politicians who held some prior political appointment are less likely to be absent than politicians with initial employment on the private market.

Grossman and Hanlon (2014) combine elements of moral hazard with adverse selection. They model the effect of monitoring on leader effort in small communities, which is required to produce a public good in combination with ability. While more monitoring positively impacts effort, it reduces average ability through adverse candidate selection, resulting in a u-shape relation between monitoring intensity and the amount of the public good. They conclude that monitoring is not strictly beneficial to the public.

My model is directly linked to the moral hazard literature as it models agents' actions depending on information available to the principal. If observability improves for a given set of incumbents, it is predicted to increase effort. Importantly, I also show that the setting is compatible with candidate selection if elections take place under no transparency.

The model shares similarities with Gersbach and Hahn (2012), monitoring is beneficial to the principal but detrimental to agents who have to exert more effort.⁵ I discuss efficiency of trans-

⁵ In Gersbach and Hahn (2012) legislators choose higher effort so that they are perceived as competent by the voters. In my model voters have preferences over effort itself.

parency from an empirical view more closely in the results section.

Most of the above-mentioned literature on transparency and monitoring is theoretical. Empirical investigations in the above-mentioned literature rely mostly on panel or cross-sectional data analysis. The quasi-experimental setting in this paper constitutes a major advantage over previous examinations. It exploits exogenous variation in monitoring and allows capturing a causal relationship between transparency and effort.

This paper complements the literature exploring the determinants of effort and presence in parliament. Research has most prominently focused on the impact of salaries (Fisman et al. 2015; Mocan & Altindag 2013), outside earnings⁶ (Arnold, Kauder & Potrafke 2014; Gagliarducci, Nannicini & Naticchioni 2010), electoral competition (Bernecker 2014; Galasso & Nannicini 2011), and institutions (Gagliarducci et al. 2011) on participation in floor voting.

3 Theory

I draw from the theoretical framework of Gagliarducci, Nannicini and Naticchioni (2010) in which politicians optimally choose how to allocate their time between work in the chamber and outside activities earning non-political rents. Their focus is on candidate selection. I extend their model by introducing voter preferences over the legislators' choice to shirk or work. My model is different in that legislators have to consider whether voters are aware of their effort and how that impacts reelection prospects. My model spans over two legislative periods and models the threat of (no) reelection. It derives different predictions from the previous literature.

I begin with a baseline model temporarily disregarding candidate selection for the moment, and assuming that all potential candidates are willing to run for office. It allows me to isolate equilibrium behavior of elected legislators who unexpectedly get exposed to more monitoring by their constituencies. In a model extension, I deal with the issue of candidate selection and show under which conditions model predictions remain unchanged.

3.1 Model Setup

Voters elect their representatives by a random draw from the pool of candidates. Legislators can stand for at most one reelection. Consequently, they are either in their first or second electoral term, which is denoted by $e \in [1, 2]$. Future payoffs are discounted with factor β .

The only decision legislators make is what share of their time $t_e \in [0, 1]$ in term e to allocate to work in parliament. The remainder is used for non-political work. Politicians thus face a time constraint which restricts their choice between political and outside work.

Legislator types α are uniformly distributed on $[0, \bar{\alpha}]$. The notion of type used in this model refers to opportunity costs. As in Caselli and Morelli (2004) or Gagliarducci, Nannicini and Natic-

⁶ Geys and Mause (2013) provide a survey of moonlighting in parliaments and also discuss the connection with legislative effort.

chioni (2010) it might reflect the skills required to earn a salary on the non-political market. But it might also be linked to other obligations outside politics like voluntary work, family or preferences for leisure. The higher α , the higher are legislator's opportunity costs.

Legislators receive identical wages W for their work in parliament which is constant over time. It encompassed both monetary salary and image rents related to being a politician. Additionally, they earn political rent $t_e R$ which linearly depends on the time devoted to parliament. They only earn the full rent, if they are full-time politicians, i.e. $t_e = 1$. This rent can be understood as the satisfaction of affecting policy outcomes or dutifully executing the representative task they have been endowed with by their constituencies.

$L(\alpha)$ reflects the concept of opportunity costs of spending time in the chamber debating and voting. Legislators receive rents $L(\alpha)$ if they engage in non-political activities parallel to their political mandate. Non-political rents increase with type α , $L'(\alpha) > 0$.⁷

$M(\alpha)$ denotes the wage legislators would earn if they ceased to be politicians. It also increases with α , $M'(\alpha) > 0$. Conceptually, it characterizes the opportunity costs of becoming a politician since it is forgone income on the private market.

An elected legislator's payoff $\pi(t_e, \alpha, W, R)$ in period e depends on the endogenous variable time t_e , and the exogenous variables type α , salary W , rents R and $L(\alpha)$ weighted by time. For notational convenience, I will abbreviate it by $\pi(t_e)$ henceforth.

$$\pi(t_e) = W + t_e R + (1 - t_e)L(\alpha) \tag{1}$$

$$= W + L(\alpha) + (1 - t_e)(R - L(\alpha)) \tag{2}$$

The timing of the model is as follows. In period 1 politicians choose time t_1 . Voters decide whether to reelect the incumbent or elect a new one. In the second period, reelected politicians make another choice t_2 . If a legislator does not get reelected, he earns his ability-dependent market wage $M(\alpha)$ in the second period.

Voters have a strict preference for dutiful legislators. The more time is devoted to work in parliament, the higher their payoff which I assume for simplicity to equal t_e .⁸

3.2 Equilibrium Choices

For comprehensiveness, I first assume no candidate selection. I.e., initially the pool of legislators is $\alpha \in [0, \bar{\alpha}]$. In the model extensions I account for candidate selection driven by the fact that some individual might not find it optimal to run for office. I show that all results go through when accounting for candidate selection.

⁷ Gagliarducci, Nannicini and Naticchioni (2010) interpret $L(\alpha)$ directly as moonlighting wages.

⁸ An alternative but similar modeling choice would be through the provision of public goods (e.g., Grossman & Hanlon 2014). Only if legislators devote some of their time to political work, they can produce the public good for their constituencies. While modeling constituents' preferences over public goods rather than effort might seem more realistic, the model would yield similar predictions.

I begin by solving for the optimal time allocation of reelected politicians in the second period which is independent of reelection prospects. $\pi(t_2) = W + L(\alpha) + t_2(R - L(\alpha))$, the legislators' second-period payoff, is increasing in time t_2 if the political payoff exceeds non-political rents, $R > L(\alpha)$. Conversely, if opportunity costs of floor voting are higher than political ego rents, the above condition is reversed. This leads to two corner solutions depending on the relative size of remuneration for doing political work and non-political rents. If $R > L(\alpha)$, all time is allocated to political work, $t_2^* = 1$, and vice versa. $\tilde{\alpha} = L^{-1}(R)$ denotes the marginal legislator type indifferent between working and shirking. $t_2^*(\alpha)$ is the optimal type-dependent time allocation in the second period.

$$t_2^*(\alpha) = \begin{cases} 1 & \text{if } \alpha < \tilde{\alpha} \\ 0 & \text{else} \end{cases}$$

All types $\alpha > \tilde{\alpha}$ earn higher market wages than political rents and thus always shirk in the second period. I will dub them H-types with $i = H$ from hereon. The remaining L-types $i = L$ characterized by $\alpha < \tilde{\alpha}$ always work in the second period.⁹ The lack of a punishment mechanism via elections leads to a perfect separation of legislators into always-shirkers and never-shirkers according to their opportunity costs of voting.¹⁰ The interesting case is characterized by $0 < \tilde{\alpha} < \bar{\alpha}$. Then both types of shirking and working politicians occur in equilibrium in the second period. For values of $\tilde{\alpha}$ outside the domain of α either everyone works or everyone shirks.

Optimal legislative effort in the second period is summarized by the following Proposition:

Proposition 1 (Second Period) *In the second period, H-type legislators ($\alpha \in [\tilde{\alpha}, \bar{\alpha}]$) always shirk whereas L-type legislators ($\alpha \in [0, \tilde{\alpha})$) always work.*

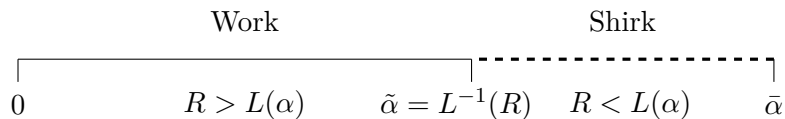
This result coincides with the finding of Gagliarducci, Nannicini and Naticchioni (2010) who find sorting into working and shirking depending on ability.

The next step is to solve for optimal allocation of time in the first period depending on monitoring. Consider first the case when no monitoring is available on behalf of the voters. They consequently lack information on politicians' attendance in chamber. Legislators in period 1 are a random draw from the population of candidates $\alpha \in [0, \bar{\alpha}]$. Not reelecting an incumbent for a second term means replacing him by another random draw from this distribution. In expectation, a new legislator yields equivalent utility to voters as the old one. Voters are therefore indifferent between keeping legislators for a second term or replacing them. Any constant reelection probability $0 \leq p_r \leq 1$ is consistent with voters' preferences. In this case when the reelection probability is independent of effort in the first term, legislators' optimal first-period time $t_1^*(\alpha)$ resembles the rationale for choosing $t_2^*(\alpha)$ optimally. Note that even certain reelection, $p_r = 1$, would not induce

⁹ Types are defined endogenously in this case depending on political rents. This is in contrast to other models exogenously defining shares of "good" and "bad" politicians (e.g., Caselli & Morelli 2004).

¹⁰ This outcome is generally known as the occurrence of lame duck legislators who shirk in absence of electoral punishment (e.g., Barro 1973). Ideas to attenuate the lame duck problem have been, e.g., to make politicians' pension dependent on last-period behavior (Becker & Stigler 1974). Political dynasties or the continuation of political careers seem to (partly) reduce the lame duck problem (Lott 1990).

FIG. 1: EQUILIBRIUM WITHOUT MONITORING



NOTE: Types α are distributed between 0 and $\bar{\alpha}$. All types below $\tilde{\alpha}$ have low opportunity costs of voting ($L(\alpha) < R$) and work. All types above $\tilde{\alpha}$ have high opportunity costs of voting ($L(\alpha) \geq R$) and thus shirk.

H-types to exert effort if it is not observed. This leads to the next Proposition of optimal time allocation without monitoring.

Proposition 2 (No Monitoring) *Without monitoring, H-type legislators ($\alpha \in [\tilde{\alpha}, \bar{\alpha}]$) always shirk while L-type legislators ($\alpha \in [0, \tilde{\alpha})$) always work in the chamber. They get reelected with probability $0 \leq p_r \leq 1$.*

Figure 1 visualizes an example of equilibrium choices without monitoring. Legislators with types distributed on $[0, \tilde{\alpha})$ are working L-types, while the top of the distribution $[\tilde{\alpha}, \bar{\alpha}]$ finds it optimal to shirk.

Now consider the case when voters observe t_1 . Perfect monitoring allows voters to make their reelection decision depending on this information. When deciding about the optimal t_1^* , legislators take into account that their choice affects their reelection probability and thus their second-period payoff.

Beginning with L-types, recall that they optimally choose $t_2^* = 1$. They will also work in the first period if the payoff from doing so and getting reelected for this exceeds the payoff from shirking in the first period and not getting reelected. The following condition¹¹ formalizes this intuition:

$$\beta(W + R - M(\alpha)) \geq L(\alpha) - R \quad (3)$$

By definition, $L(\alpha) - R < 0$ for L-types. If the left-hand side is positive this would be a sufficient condition such that L-types would work in the first period. Rearranging, it is required that $W + R \geq M(\alpha)$ which has a straightforward interpretation: the payoff from working in the first period must be larger (or equal) than the wages legislators would earn if they were not politicians. In other words, this is the candidate selection condition for L-types. If L-types find it optimal to be politicians in the first place, then working yields a higher payoff than shirking in the first period.¹² Assume for the moment that this guarantees them a second term (which will be shown to be consistent with voter preferences later on). This leads to the next proposition.

Proposition 3 (L-type legislators) *L-type legislators ($\alpha \in [0, \tilde{\alpha})$) never shirk.*

¹¹Note that the inequality is basically the first order condition of a payoff maximization problem of the following form: $\max_{t_1} W + t_1(R + \beta(W + R)) + (1 - t_1)(L(\alpha) + \beta M(\alpha))$.

¹²If $W + L(\alpha) \geq M(\alpha)$, then $W + R \geq M(\alpha)$ holds for L-types because $R > L(\alpha)$ if $\alpha < \tilde{\alpha}$.

H-types always shirk in the second term if they get reelected. They earn their non-political rents plus salary conditional on reelection. Their period 1 payoff is strictly decreasing in t_1 . Since the outside option yields more attractive rents than floor voting, rents in period 1 incentivize to shirk. However, in contrast to the second-term decision, shirking deteriorates the reelection prospects because it allows voters to distinguish H-types from L-types. Shirkers can be punished by not getting reelected and falling back to earning the market wage. H-type legislators consequently face a trade-off between earning a lot by shirking in the first period and getting reelected for the second term.

What does it take to make H-type politicians mimic low-ability legislators and not to shirk in the first period if this would guarantee them reelection? The intuition is analogous to the L-types. The sum of payoffs from serving two terms (working in the first and shirking in the second) must be larger than the payoff from serving one term without reelection (shirking in the first and earning market wages afterwards):

$$W + R + \beta[W + L(\alpha)] > W + L(\alpha) + \beta M(\alpha) \quad (4)$$

$$\beta[W + L(\alpha) - M(\alpha)] > L(\alpha) - R \quad (5)$$

Equation (5) has a nice interpretation: the discounted future value of serving a second term has to compensate for the forgone income from behaving well in the first period instead of shirking (assuming certain reelection). The right-hand side is positive by definition. The left-hand side is positive if the candidate selection condition for H-type is fulfilled. Rearranging the equation to

$$\beta W + R > (1 - \beta)L(\alpha) + \beta M(\alpha) \quad (6)$$

it is easy to see that the right-hand side is increasing in ability α . For a critical ability $\hat{\alpha}$, the right-hand side will exceed the left-hand side. H-types with α below a critical $\hat{\alpha}$ will opt for working in the first period to secure a second term. Extreme types with $\alpha \geq \hat{\alpha}$, in contrast, are better off shirking in the first period and not getting reelected because their outside rents are better than anything a political career potentially can offer to them. The optimal time allocation in the first period with guaranteed reelection is:

$$t_1^*(\alpha | p_r = 1) = \begin{cases} 1 & \text{if } \alpha < \hat{\alpha} \\ 0 & \text{else} \end{cases}$$

The most interesting case occurs if $\hat{\alpha} \in (\tilde{\alpha}, \bar{\alpha})$ such that H-types are split into workers and shirkers. In the less exciting cases either $\hat{\alpha} < \tilde{\alpha}$ such that all high types optimally shirk in the first period, or $\bar{\alpha} < \hat{\alpha}$ such that all high types work and get reelected.

Proposition 4 (Monitoring, H-type legislators) *With monitoring, in the first period H-type legislators ($\alpha \in [\tilde{\alpha}, \hat{\alpha})$) always work if reelection for this is guaranteed, while the very able ($\alpha \in [\hat{\alpha}, \bar{\alpha}]$) always shirk and do not get reelected.*

Are voters willing to reelect every politician who did not shirk in the first period and to discard all shirkers?¹³ When facing a first-period working politician, voters are uncertain regarding whether he is an L-type who will also work in the second period, or a H-type who will shirk after reelection. Using Bayesian updating, the probability that a politicians who was observed working in the first period is an L-type is the following:

$$P(\alpha < \tilde{\alpha} | t_1 = 1) = \frac{P(t_1 = 1 | \alpha < \tilde{\alpha})P(\alpha < \tilde{\alpha})}{P(\alpha < \tilde{\alpha}) + (1 - P(\alpha < \tilde{\alpha}))P(t_1 = 1 | \alpha > \tilde{\alpha})} = \frac{\tilde{\alpha}}{\hat{\alpha}} \quad (7)$$

The numerator reflects the probability of not shirking conditional on being an L-type weighted by the probability of being an L-type. Since L-types always work, it simplifies to $P(\alpha < \tilde{\alpha}) = \frac{\tilde{\alpha}}{\hat{\alpha}}$. The denominator is the type-weighted probability that a newly elected random politician will never shirk in the first period. Equation (7) lends itself to significant simplification: the probability of being an L-type among the working ones is the probability of randomly drawing an L-type $\alpha \in [0, \hat{\alpha})$ from the distribution of working politicians $[0, \hat{\alpha})$.

After the first term, voters will only reelect a working politician if this yields a higher payoff than randomly drawing a new politician from the entire population of candidates. Under the following condition legislators are willing to reelect all working legislators

$$\frac{\tilde{\alpha}}{\hat{\alpha}} > \frac{\hat{\alpha}}{\bar{\alpha}} \quad (8)$$

The condition has a straightforward interpretation: reelecting working politicians pays off if the probability that a first-period worker is an L-type, $\frac{\tilde{\alpha}}{\hat{\alpha}}$, is larger than the probability that a newly elected politician will work, $\frac{\hat{\alpha}}{\bar{\alpha}}$. On the contrary, if the share of high-ability types working in the first period is relatively high, voters would never reelect working politicians. The probability that the incumbent will shirk in the second term is too high. If nobody gets reelected for working in the first term, this affects the H-types first-period choice: all H-types would shirk in the first period and not get reelected for that.

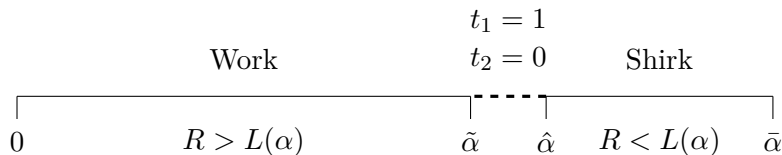
Reelections thus offer voters an institutional and effective control mechanism over their agents: it allows them to punish shirking by not reelecting incumbents putting too little effort into legislative work.

Figure 2 depicts an example of equilibrium choices with monitoring. While the lower and upper tails of the type distribution remain unchanged in comparison to the case without monitoring, types between $[\hat{\alpha}, \bar{\alpha}]$ work during their first term and shirk in the second one. Suppose $\tilde{\alpha} = 0.6$ and $\bar{\alpha} = 0.7$, such that equation (8) is fulfilled and the share of working H-types is relatively low. In contrast, when $\tilde{\alpha} = 0.2$ as in Figure 3, it is too likely that first-period workers will shirk in the second period. Then nobody gets reelected and legislators behave as without monitoring.

I now derive testable predictions from the model. Suppose that monitoring improves from no monitoring to perfect monitoring during an ongoing term. L-types ($\alpha \in [0, \hat{\alpha})$) will continue

¹³The reelection mechanism is similar to the one in Besley (2004). Voters observe politicians implementing their desired policy but are uncertain over whether they will continue doing so in the second term.

FIG. 2: EQUILIBRIUM WITH MONITORING



NOTE: Types α are distributed between 0 and $\bar{\alpha} = 1$. All types below $\tilde{\alpha} = 0.6$ have low opportunity costs of voting ($L(\alpha) < R$) and work. All types above $\hat{\alpha} = 0.7$ have high opportunity costs of voting ($L(\alpha) \geq R$) and thus shirk. Types between $\tilde{\alpha}$ and $\hat{\alpha}$ work in the first period ($t_1 = 1$) but shirk in the second one ($t_2 = 0$). The reelection condition $\frac{\hat{\alpha}}{\bar{\alpha}} > \frac{\tilde{\alpha}}{\bar{\alpha}}$ is fulfilled since $\frac{0.6}{0.7} > \frac{0.7}{1}$.

working and and legislators in the upper end of the distribution ($\alpha \in [\hat{\alpha}, \bar{\alpha}]$) will continue shirking. All legislators in their second term will not adapt their behavior as well. If condition (8) holds and the share of L-types in the population is relatively large such that working is rewarded with reelection, it will be optimal for H-type legislators $\alpha \in [\tilde{\alpha}, \hat{\alpha})$ in their first term to switch from shirking to working. Averaging over all legislators, the expectation is that legislators will behave more dutifully on average.

Prediction 1 *If monitoring improves during an ongoing legislative period, absences will decrease on average.*

The average reduction in shirking is a consequence of some H-types adjusting their effort during their first term in order to please their voters. The main effect would therefore be expected in the subgroup of incumbents running for reelection. In contrast, politicians ending their political careers do not face reelection concerns and should not be affected by the change in monitoring. This is stated in the following prediction.

Prediction 2 *If monitoring improves during an ongoing legislative period, absences will decrease on average among politicians running for reelection. No change is expected for legislators in their last term.*

This prediction can be generalized even more. Legislators who are particularly reliant on reelection can be expected to be more responsive to monitoring than legislators who have less to lose if not reelected.

FIG. 3: VOTERS DO NOT REELECT WORKING INCUMBENTS



NOTE: Types α are distributed between 0 and $\bar{\alpha} = 1$. $\tilde{\alpha} = 0.2$ and $\bar{\alpha} = 0.7$. The reelection condition $\frac{\hat{\alpha}}{\bar{\alpha}} > \frac{\tilde{\alpha}}{\bar{\alpha}}$ is not fulfilled since $\frac{0.2}{0.7} < \frac{0.7}{1}$.

3.3 Extension: Candidate Selection

The question is whether all politicians will find it optimal to become politicians in the first place. The empirically relevant case is the change in behavior when monitoring increases during an ongoing legislative term. Therefore, I concentrate on candidate selection when monitoring is not available. I only have to distinguish L-types ($\alpha \in [0, \tilde{\alpha})$, who always work) from H-types ($\alpha \in [\tilde{\alpha}, \bar{\alpha}]$, who always shirk).

To candidate, a legislator has to be better off being a politician than earning market wages. L-types candidate if $W + R \geq M(\alpha)$. Denote the type for which the condition holds with equality by $\alpha_L = M^{-1}(W + R)$. Types above α_L do not want to become politicians, whereas types below the threshold do. If $0 < \alpha_L < \tilde{\alpha}$, some L-types candidate; if $\alpha_L < 0$, nobody candidates; and if $\alpha_L > \tilde{\alpha}$, everybody candidates.

H-types candidate if $W + L(\alpha) \geq M(\alpha)$. If the condition holds (does not hold) for all types, everybody (nobody) becomes a politician. Maximizing the condition, allows to capture the intermediate cases and arrive at the candidate selection result of Gagliarducci, Nannicini and Naticchioni (2010). If wages deteriorate when becoming a politician, $L'(\alpha) < M'(\alpha)$, negative hierarchical sorting occurs and H-types with low α candidate. The opposite is true if earnings improve due to becoming a politician, $L'(\alpha) > M'(\alpha)$.^{footnote}Diermeier, Keane and Merlo (2005) provide evidence for such an earnings pattern in US Congress.

In order to sustain the model predictions and find an effect of monitoring on legislators' effort, the existence of some H-types who are willing to mimic low α types in the first period, is required. Monitoring only has an effect if voters are uncertain over the legislators' types even though their behavior can be observed. This is the case if either everybody becomes a politician, there is negative sorting (lower end of α distribution, or positive sorting with some working H-types running for office).

In sum, this extension provides the intuition that even when accounting for candidate selection, monitoring can have the expected effect derived from the main model.

3.4 Discussion

I briefly review and discuss some of the outcomes and modeling choices.

The literature portrays a dark picture of politicians. Essentially voters are facing a trade-off between diligent but incompetent representatives and able but shirking ones. Adding monitoring and the reelection rationale to the framework, slightly brightens the picture. Not only is it possible that high α types candidate for public appointment. Monitoring motivates part of them to exert more effort. Extending the time horizon to a second period allows some high α types to commit themselves to work in the way preferred by voters if they get reelected for that.

If the ability to earn rents on the private market is correlated with political skills to, e.g., provide public goods at a low cost, monitoring can improve the public goods provision. On the other hand, α may not only reflect wage-earning ability and competence, but the more general concept of opportunity costs of doing politics. Electing low- α politicians then means selecting representatives

who are able to fully concentrate on their duties in parliament and not being distracted by other competing activities.

To keep with the literature, the punishment mechanism in the model is chosen to run via voters not reelecting shirking politicians. Alternative punishment mechanisms through parties or interest groups in the form of government functions or reduced campaign contributions would lead to the same model predictions if they depended on (not) observing attendance.

4 Institutional Background and Descriptives

4.1 The Swiss Upper House

Switzerland has a bi-cameral parliamentary setup. The Lower House, the Nationalrat, is elected through a proportional system. The Upper House, the Ständerat, represents the Swiss cantons and is elected mostly through majoritarian elections. The two exceptions with proportional elections are the cantons of Neuchâtel and Jura. Each of the 20 full cantons is represented by two legislators, and the six half-cantons hold one seat each. This adds up to 46 council members. The institutional setup closely resembles the one of the U.S. congress. The US Senate has many institutional analogies to the Swiss Upper House. For more details on the Swiss political system, I refer the reader to Kriesi and Trechsel (2008).

Importantly for this paper, the Swiss Parliament is traditionally viewed as a militia assembly. The original idea rests on the notion than citizens should engage themselves in politics or voluntary activities on top of their bread-earning work. Though both chambers have undergone significant professionalisation in the past decades (e.g., Müller 2015), the option to follow a salary-earning profession next to holding a seat in parliament still exists and is made use off.

The focus of this paper is on the Upper House. It meets four times per year during pre-assigned dates in the spring, summer, fall and winter sessions. Each of the four yearly legislative sessions lasts three weeks. Meetings take place from Mondays to Thursdays. Monday meetings begin in the afternoon allowing for same-day arrival from each part of Switzerland. Most of the remaining meetings take place in the morning, though sometimes two meetings a day are scheduled. Final passage votes are decided upon almost exclusively on the very last Friday of a legislative session. This results in at least 13 and at most 15 meetings per legislative session. The legislative period lasts for four years and commences with a winter session.

The 46 members of the Upper House who were elected in fall 2011 were born on average in 1956, the oldest member being born in 1945 and the youngest in 1979. Only roughly 20% are female and the majority of 74% has German as their official language.¹⁴ 22% hold a doctoral degree which is significantly above the Swiss average of 5.6%.¹⁵ About a third have an officer rank in the Swiss army. 72% are married and have 2 children on average. These are lower bounds since disclosure of

¹⁴Note that legislators in the Upper House speak German, French and Italian. While the first two dominate, during debates legislators typically speak in their preferred language.

¹⁵The number was received on request from the Swiss Statistical Office and reflects the status quo in 2014.

marital status and number of children is not mandatory. 8.7% are elected through a proportional system, the remainder is elected proportionally. At the beginning of the 49th legislative period, they have served 8 years in parliament or an equivalent of two terms. 20% are in their first term. Three quarters were running for reelection in the 2015 national elections, 12 retired afterwards.

More than two thirds of the members hold an occupation alongside their political mandate which I will refer to as moonlighting. However, already the four three-week sessions require time implying additional work load. On top, most councilors are members of specialized committees. Parallel careers with executive positions in the private sectors are therefore virtually impossible.¹⁶ The most commonly encountered professions among moonlighting politicians are lawyers (32.4%) and entrepreneurs (17.6%). Only roughly a third are full-time politicians.

Table 1 summarizes the descriptives. Personal information come from the parliament’s webpage.

Table 1: DESCRIPTIVE STATISTICS OF INDIVIDUAL LEGISLATORS

Variable	Mean	Std. Dev	Min.	Max.	Obs.
Birthyear	1956	7.464	1945	1979	46
Female	0.196	0.401	0	1	46
German	0.739	0.444	0	1	46
Doctor	0.217	0.417	0	1	46
Officer	0.348	0.482	0	1	46
Married	0.717	0.455	0	1	46
Children	2.0	1.530	0	6	46
Proportional election	0.087	0.285	0	1	46
Years in parliament	7.891	6.061	0	25.5	46
First term	0.196	0.401	0	1	46
Full-time politician	0.283	0.455	0	1	46
Running for reelection	0.75	0.438	0	1	44

NOTE: Descriptive statistics. Characteristics of the 46 members of the Upper House at the beginning of the 49th legislative period in 2011. Source: Parliament homepage www.parlament.ch.

4.2 Institutional Change: Increase of Transparency

Traditionally, the Upper House has voted by show of hands. The president announced the voting alternatives and legislators raised their hands for their preferred alternative. Two designated members of the council served as vote counters. The aggregate voting outcome was documented in the chamber’s minutes. Since 2006 all sessions were recorded on video and are accessible online. Other than through the laborious screening of video records it was impossible to systematically monitor individual legislators’ attendance and voting decisions.

The voting system was reformed to a more transparent one after a long and heated debate.

¹⁶The information is based on an interview with a current member of the Upper House conducted on 23 August, 2016.

Though initially rejected by the majority of council members, the transparency bill¹⁷ was resumed after counting mistakes were prominently detected by the media in winter 2012. It can thus be argued that the transparency bill was revived by an exogenous shock through media pressure. While the councilors generally agreed that a reduction in counting mistakes was desirable, concerns were voiced over the potential deterioration of discourse culture in the chamber. Increased pressure from the parties and the media were typically mentioned as arguments against publishing voting records. According to members of the Upper House, the partial publication of voting results was the result of a (very Swiss) compromise. The new voting system was approved with a majority of 28 to 14 votes in spring 2013 and inaugurated one year later.

Starting in spring 2014, all votes in the Upper House are taken electronically. The system is operationalized by a set of three buttons at every legislator's desk. Each vote lasts for 30 seconds during which vote choices can be adjusted flexibly. A flashing note on two clearly visible electronic boards signals the last eight seconds of the vote. The boards display a seating chart of the chamber and vote choices (green for yes, red for no, white for abstain) appear in real time. In cases of clear voting majorities, it is common practice for chamber presidents to expedite the voting process. However, the last eight seconds of the vote are always visible and cannot be skipped.

While all votes are conducted electronically, individual decisions on four types of votes get published automatically on the parliament's website in PDF format: a) *final passage votes* (ultimate decision on acceptance/rejection of bill); b) *total votes* (votes taking place after several paragraph-by-paragraph votes before the bill is transferred to the Lower House); c) *debt brakes* (required for one-time expenses above CHF 20 million or recurring expenses above CHF 2 million); d) *emergency votes* (bills requiring immediate implementation). The PDF displays information on how each individual legislator votes (yes, no, abstain) and whether he was excused or did not participate in the vote. It is also marked who acted as the chamber's president. For the remainder of the paper, I will refer to vote types a) to d) as *nominal* votes, independent of the voting system at place. The remaining votes, encompassing detail votes and procedural votes, remain unpublished. I will refer to these types of votes as *secret* votes.¹⁸ The distinction of secret and nominal thus refers to the fact whether a type of vote is automatically published or not at *some* point in time.

The Swiss Lower House (Nationalrat) serves as a good example that changes in voting procedures can transmit into public information on attendance rates. The Lower House takes all votes electronically such that they are recorded and fully published online since 2007. Not only in theory, it is therefore easy to compute attendance rates for this chamber. Several newspapers, mostly tabloids with high circulation but also well-renowned newspapers, reported extensively on legislators' participatory shirking (e.g., 20 Minuten 2012a, 2012b; Neue Zürcher Zeitung 2014; SRF 2012). They published rankings of the least dutifully acting legislators. Missing votes was exclusively framed as "bad" behavior. On top of newspaper articles, the independent policy platform

¹⁷ The bill was the parliamentary initiative with bill number 11.490 by This Jenny 2011. All debates can be found in the parliament's minutes, the Amtliches Bulletin (Parlamentsdienste) which are available online (www.parlament.ch).

¹⁸ As before 2014, ten members of the Upper House suffice to request a recorded vote on any type of vote. However, legislators hardly ever make use of this option.

Politnetz offers rankings of attendance rates computed from nominal votes. It has started publishing this information for the Upper House precisely since the introduction of electronic voting.

4.3 Dataset and Measuring Absences

Absence during votes can take one of two forms: excused missing of a complete voting day or selective absence during some votes.

Excused absences are controlled daily by call of names at the beginning of each meeting (Standing Orders of the Council of States 2015). Preferably, legislators should inform the House’s secretary about their absence in advance if possible. Excused members miss a complete meeting and consequently all votes taken on a particular day. The three recorded reasons for excused absence are “illness”, “maternity leave”, and “other”. The residual category “other” encompasses absences due to commission work or travel abroad among others but cannot be directly attributed to more specific causes.

Selective absences describe the cases when legislators fail to appear for a vote even though they were present during the morning call of names. During the meetings, legislators are free to leave the chamber at any point in time. Predominantly, they make use of this possibility to work, or for meetings with interest groups and lobbies. Other less frequent activities include private meetings, appointments with voters, school classes or simply taking a break.¹⁹ The chamber of the Upper House has two symmetric exits on the sides. They lead into antechambers equipped with tables and working stations. When a vote is about to take place, a bell activated by the chamber president or the secretary signals the legislators to return to the chamber. It is only audible in the antechambers. If councilors spend their time in the parliament’s cafe, they can follow the meetings on TV screens which, however, are not equipped with a sound system.²⁰ The bell cannot be heard in other parts of the parliament building. In theory councilors have the opportunity to get back in time for votes.²¹

The data span the 49th legislative period commencing with the summer session 2012 and ending with the last session in September 2015. All sessions and meetings are chronologically reported by date in the parliamentary minutes (Wortprotokoll, Amtliches Bulletin). They cover all speeches, debates, and importantly votes including their aggregate voting outcomes. The type of vote is documented as well, allowing to code whether a vote was a nominal or a secret one. During the legislative period, two of 46 members left the chamber prematurely, either due to health-related reasons or appointment into government. They were replaced by two new members. Table 9 in the Appendix reports the names and dates of the replacements.

Until 2014, a camera captures the councilors during votes. The videos allow me to construct a

¹⁹This information is based on an interview with a members of Upper House conducted on 18 August, 2016.

²⁰Traditionally, a member of the government is the last to speak before a vote. Seeing such a speech on screen is therefore one, albeit imprecise, indicator for an approaching vote.

²¹Fisman et al. (2015) report that members of the European Parliament only signed the register in the morning to secure the daily allowance and subsequently leave the parliament for the entire day. Such a behavior on a regular basis is uncommon in Switzerland. Legislators would typically remain within reach of the chamber.

dataset of individual attendance per vote prior to electronic voting.²² The seating arrangement in the chamber varies little over time, facilitating the tracking of legislators. Legislators are counted as present if they sit on their designated places during a vote. They are treated as absent if they have left the chamber.

Starting in 2014 when electronic voting was first introduced, the video recordings of all meetings continued to exist. The difference with regard to filming lies in the camera capturing one of the electronic boards during the time of the vote instead of the legislators. I use the final voting outcome displayed on the board to code whether a legislator attended a vote or not.²³

I deal with two special cases relating to the coding of absences. The first one regards the chamber presidents, the other one the pre-reform vote counters. The chamber presidents are elected members of the Upper House. They guide through the meetings, make all announcements, and conduct the votes during a term of one year. During that time they do not actively participate in votes with the exception of debt brakes, emergency votes, and ties between yes and no votes. They consequently vote rarely (though they are present), and the vast majority of their voting activity concentrates on nominal votes. I treat legislators acting as chamber presidents as being present for this reason.

Vote counters constitute another special case in the pre-reform period. Though they are visible on video, it is typically unclear whether they have voted since they do not actively raise their hand. I code all vote counters as present. I will run robustness tests regarding the special role of chamber presidents and vote counters since they have much less leeway to strategic absence due to their prominent institutional roles requiring the continuous presence during meetings.

Data sources are the following. I received the complete video recordings of all meetings covering the full 49th legislative period from the parliamentary services. Information on excused members comes from the parliament's official attendance registers. Causes of absences were provided by the parliament's office.

4.4 Descriptives and Voting Patterns

The main descriptives at vote level and regarding individual absences are summarized in Table 2. The data encompass a total of 1,782 votes. It corresponds to about 15 votes per meeting. Around 56% were secret votes, the remainder were nominal ones. Total votes (21%) and final passage votes (14%) are the most frequent nominal categories. Debt brakes and emergency votes account for 8.5% and 0.2% of all votes respectively. Most votes are taken on Wednesdays and Thursdays (25% respectively). They are least frequent on Mondays and Tuesdays (17% respectively).

Votes take place between the first minute of the meeting and after more than 6 hours with an

²²The video records of the Upper Council have been used to explore the quality of political representation and voting patterns in this chamber (e.g., Benesch, Bütler & Hofer 2015; Bütikofer 2014; Eichenberger, Stadelmann & Portmann 2012; Hug & Martin 2011; Portmann & Stadelmann 2013; Stadelmann, Portmann & Eichenberger 2013, 2014).

²³In theory it is possible that a legislator is physically present during a vote but does not press any of the vote buttons. I count such behavior as absence since the legislator did not actively participate in the vote. This is also how absence statistics would be constructed.

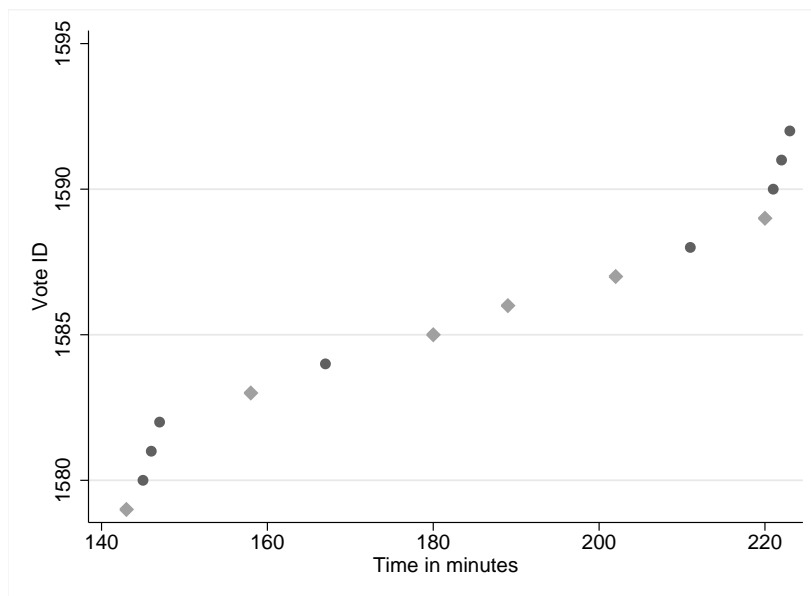
average of 2 hours. Though many votes appear as single, “independent” votes (48.5%), clusters of several votes in a row are just as frequent. I define a “block” as consecutive votes without interruption by speeches or debates. There are on average 4.8 votes in such a block. Excluding final passage votes, which are characterized by very long blocks with up to 29 votes in a row, the average is 2 votes per block. An exemplary distribution of votes can be found in Figure 4. It shows the occurrence of nominal votes (circles) and secret votes (diamonds) over time in minutes on a randomly picked day (29 May, 2012). 8 out of 14 votes were nominal. The first four votes are executed in a block one after the other. They are followed by six independent votes every 9 to 13 minutes. The meeting finishes with four consecutive votes in a block.

Independent votes are most likely to be secret (81%) and total votes (16.5%). Vote blocks are either exclusively made of secret votes (24%), nominal votes (29%) or a mix thereof (46%). In such mixed blocks, secret votes make up the largest share (42.6%) and they almost always commence a block. Purely nominal blocks are dominated by total votes (75.4%) and debt votes (22.9%).

All time variables have the potential to affect absences. In the regression analysis, I will control for the time a vote was taken during a meeting, the number of votes in a block and the votes position in a block, as well as the day of the week.

Absences account for 12.5% of individual observations, i.e., legislators miss one in eight votes. On average, 5 legislators are absent during votes. 1.7% can be attributed to excused absences. The share of votes missed at individual level, however, varies tremendously. While some legislators

FIG. 4: DISTRIBUTION OF VOTES OVER TIME DURING A MEETING



NOTE: Vote patterns on 29 May, 2012. Occurrence of nominal (circle) and secret (diamonds) votes. The x-axis shows time in minutes (with 0 defined as the beginning of the meeting). The y-axis shows a continuous vote ID.

Table 2: DESCRIPTIVE STATISTICS OF VOTE CHARACTERISTICS

Variable	Mean	Std. Dev	Min.	Max.	Obs.
Secret	0.558	0.497	0	1	1782
Total vote	0.212	0.409	0	1	1782
Final vote	0.143	0.350	0	1	1782
Debt brake	0.085	0.279	0	1	1782
Emergency vote	0.002	0.047	0	1	1782
Absent	0.125	0.331	0	1	54019
Excused	0.017	0.131	0	1	54019
Time	2.043	1.406	0	6.4	1782
Votes per block	4.669	6.667	1	29	1782
Position in block	2.834	4.068	1	29	1782
Monday	0.173	0.379	0	1	309
Tuesday	0.171	0.377	0	1	305
Wednesday	0.251	0.434	0	1	447
Thursday	0.253	0.435	0	1	451
Friday	0.152	0.359	0	1	270

NOTE: Descriptive statistics of vote characteristics. Source: Parliament homepage www.parlament.ch; Amtliches Bulletin; Videos of legislative sessions 2012-2015.

miss as little as 3.3% of all votes, others are absent during up to 27% of the votes. This gives an intuition for the strong individual variation in attendance rates across legislators. Absences are highest during total votes (15%) and slightly below 12% during debt and secret votes.

As I will argue below, total votes belong to the vote category best suitable for the analysis of nominal votes. Final passage votes, in contrast, have institutional characteristics which make a treatment effect of monitoring unlikely.²⁴

A stylized fact about procedures on the final session day is that almost exclusively final passage votes are taken which are nominal votes by definition.²⁵ These meetings last for less than an hour with all final votes taken consecutively without interruptions: the average time between one final vote and the next one amounts to 45 seconds (and the maximum time to 2 minutes), compared to 22 minutes on average for votes taken on all other days. Excluding excused legislators, only 0.49% of 11,262 observations from last session days are absences. In other words, if a legislator is present on the final session day, he is going to participate in all votes almost with certainty. This holds already for pre-reform votes, such that no treatment effect can be expected.

²⁴Indeed, running the baseline regressions with final passage votes as the only nominal category, yields no significant result. It suggests that no changes in absences during final passage votes were induced after reform, even though monitoring improved for these vote categories.

²⁵The exception are 10 secret votes which took place on Fridays.

5 Identification

Prediction 1

The aim is to identify the average treatment effect on the treated of monitoring on shirking by absence from floor voting. The idea is to compare individual attendance in the Upper House during nominal and secret votes before and after the reform. The main model Prediction 1 to be tested suggests a drop in the probability of being absent once absences are monitored. The dependent variable of interest $Absence_{ij}$ takes on value 1 if legislator i was absent during vote j , and 0 if he was present.

Identification is based on the exogenous variation of the monitoring technology for some votes (nominal votes) while the remaining ones are always kept undisclosed (secret votes). Nominal votes therefore define the treatment group, and are compared to the non-treated votes in the control group. The variable $Nominal_{ij}$ takes on value 1 if vote j was such a vote. It is 0 for all secret votes. Control and treatment are thus defined over vote categories. The allocation into control and treatment group is defined by the legal form of the vote. There is no concern about a potential selection into treatment bias. Moreover, since complete video recordings of all legislative sessions exist, the sample is not selective.²⁶

The focus on a single legislative period ensures an almost identical composition of the chamber. The same individuals are observed voting on the two different kinds of votes before and after the treatment. By controlling for individual legislator fixed effects, I estimate the within variation of absences while shutting out all time-invariant legislator characteristics. Examples of such time-invariant control variables frequently used in the voting literature are birth year, outside employment, marital status, number of children or party affiliation. Including legislator fixed effects allows to estimate the individual treatment for legislators instead of estimating variation between the politicians.

The variable $Reform_{ij}$ is defined as 1 for all votes taken after the change in voting procedures, and 0 before the reform. Since the institutional change takes place almost in the middle of the legislative period, a large number of votes takes place before and after the reform for both types of votes.

Are published and never-published votes randomly distributed or does a selection issue exist? If a difference between the pre- and post-reform period existed, it might affect the results. I examine the distribution of votes types over time (cf. Figure 5). The share of votes getting published varies strongly day by day. But a t-test rejects the hypothesis that the share of publishable votes is systematically different before and after the change of the voting system. I also run a t-test of the shares of votes taken by type and do not find any significant difference between the numbers of

²⁶Recorded votes might constitute a selective sample of the universe of votes (Carrubba, Gabel & Hug 2008; Carruba et al. 2006; Hug 2010). The bias is particularly strong if recorded votes are conducted on request: members of parliament are called to order by the mere appearance of a roll call vote and consequently are present more often during recorded votes. The bias is less severe in countries like Italy where most votes are taken electronically (cf. description by Gagliarducci et al. 2010).

votes before and after electronic voting. The common support assumption demanding a sufficient number of observations in all subgroups defined by treatment and control is thus fulfilled.

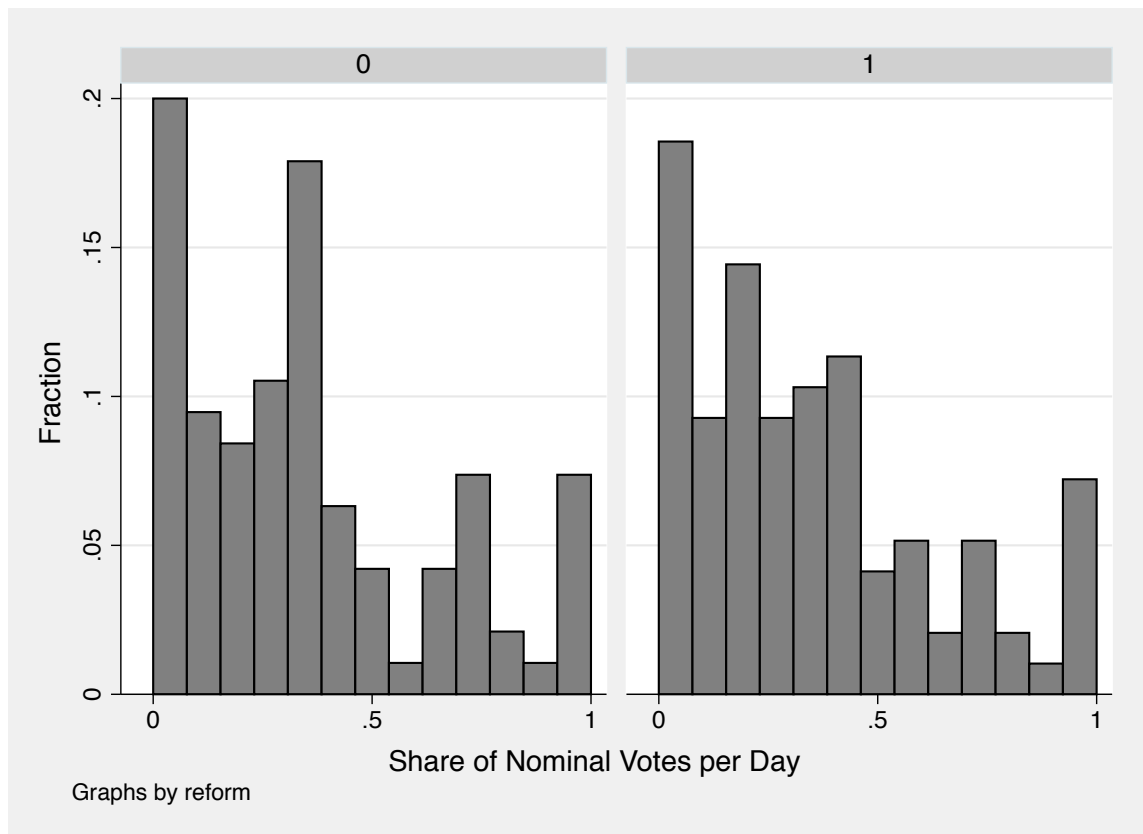
The reform itself was exogenously driven by the medial revelation of result-critical counting mistakes. The transparency bill had originally been rejected and was only revived through media pressure - a process uncommon to Swiss politics.

Following the above argumentation allows me to run a difference-in-difference (DiD) regression. Let α be the intercept, β_1 to β_3 the main coefficients, X_{ij} a vector of control variables as explained in the previous section and ξ its vector of coefficients, u_i the legislator fixed effects with coefficients ψ , and ϵ_{ij} the error term. The estimation equation is of the following form:

$$Absent_{ij} = \alpha + \beta_1 Nominal_{ij} \times Reform_{ij} + \beta_2 Nominal_{ij} + \beta_3 Reform_{ij} + \xi X_{ij} + \psi u_i + \epsilon_{ij} \quad (9)$$

The coefficient of interest β_1 identifies the average treatment effect on the treated (ATET) under several assumptions I will detail below. From theory, I expect the coefficient to be negative, reflecting a decrease of the probability of being absent once attendance rates can be monitored

FIG. 5: DISTRIBUTION OF NOMINAL VOTES PER DAY



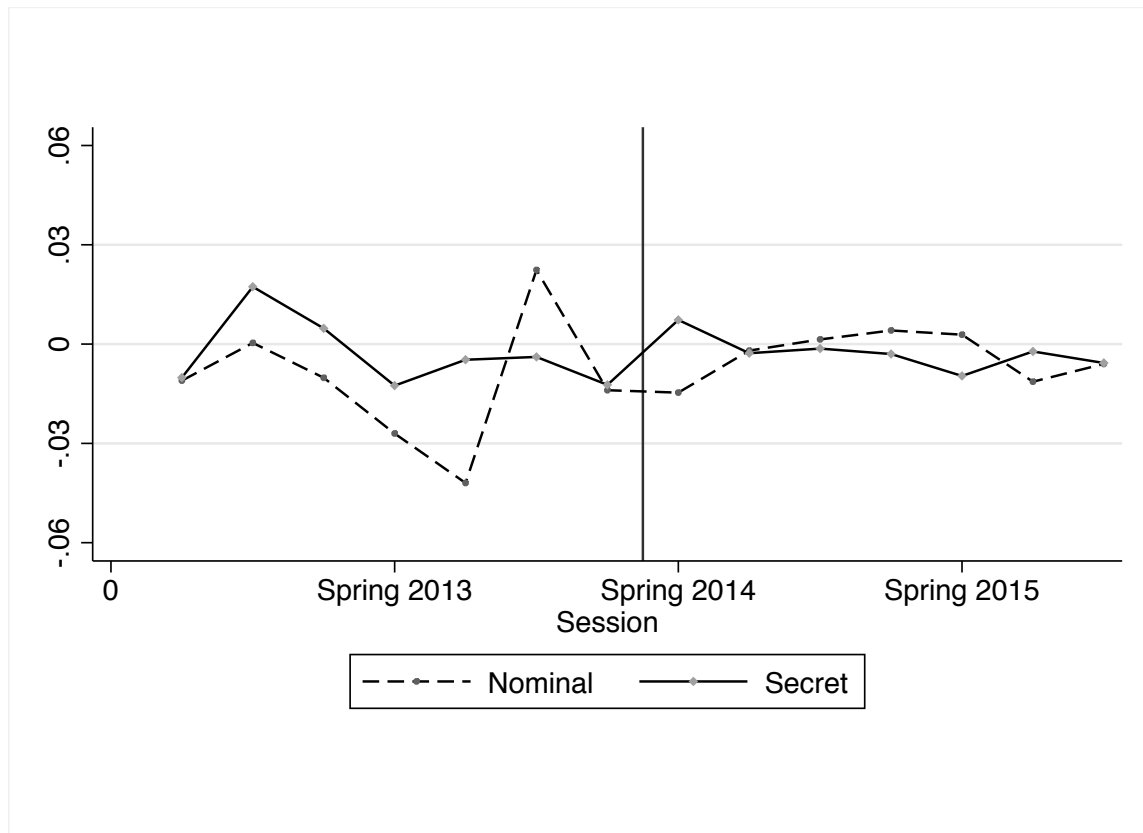
NOTE: Distribution of the share of nominal votes per day conducted before (0) and after (1) the reform.

for nominal votes. β_2 represents the pre-reform difference in absences between nominal and secret votes. There is no theoretical expectation for this coefficient. β_3 is the change in absence rates for secret votes around the reform. In theory, the reform should have no effect on absences during secret votes. However, factors unrelated to monitoring but changing over time might be at play, making the use of a control group necessary in the first place. For instance, approaching elections might motivate legislators to be present more often during all kinds of votes. Lower absence rates in the second half of the legislative period might thus be an artifact of an electoral cycle and have little to do with improved monitoring. Also, bills differ in their characteristics which might vary over time in a non-random fashion. Some of these characteristics, e.g. importance or topic, might be driving absence rates in a way orthogonal to the monitoring change.

The most important assumption for running a DiD regression is a common trend between nominal and secret votes:

Assumption 1 (Common trend conditional on covariates) *If the voting system in the Upper House had not changed, the difference in absences between nominal and secret votes, conditional*

FIG. 6: INSPECTION OF COMMON TREND ASSUMPTION



NOTE: The x-axis is a continuous indicator of voting sessions. The y-axis shows the aggregate residuals per session and type of vote of a regression of *Absent* on a set of covariates.

on covariates, would have evolved as before the reform.

Though the validity of this assumption cannot be investigated in full since it relies on potential outcomes, the development of pre-reform trends in the control and treatment groups can be examined. I regress the dependent variable *Absent* on control variables X_{ij} and legislator fixed effects for each of the four subgroups defined by the combinations of nominal/secret votes and pre/post reform. I then calculate the residuals and plot the mean residuals aggregated by voting session.

Figure 6 shows the development of the residual over time, the dashed line representing nominal votes and the solid line secret votes. The vertical line marks the timing of the reform. The development between control and treatment group evolves in parallel, especially in the first four periods. The gap slightly widens in summer 2013. The fall session 2013 is an extreme outlier. For robustness, I will drop this session in the empirical analysis. But it does not affect the overall results. After the treatment, the gap between the residuals closes and remains close to zero. In sum, this provides some evidence that treatment and control group evolved in a similar fashion in the pre-treatment period. It also gives guidance to carefully deal with the outlier.

The next assumption relates to the fact that not only the rules regarding the publication of individual voting decisions have changed, but also the procedure switched from voting by show of hand to electronic voting. This change occurred for all types of votes.

Assumption 2 (Electronic Voting) *If electronic voting had an effect on the probability of being absent, the pure “electronic voting effect” is identical for nominal and secret votes.*

In theory, the electronic voting system might have made it easier to submit a valid vote: the electronic buttons can be pressed at any point in time as long as the electronic system operates. In contrast, when votes were still taken by show of hands, the questions to vote “yes”, “no” or “abstain” were taken one after each other. For legislators planning to accept a bill, presence was required already at the start of the vote. Such an effect can be expected irrespective of the vote type.

Prediction 2

The second model prediction to be tested postulates a zero effect for legislators in their last term, in contrast to a negative effect of monitoring on absences for legislators continuing their political careers. The prediction requires a test of a differential treatment effect in two exogenously defined groups. Let $Group_{ij} = 1$ denote one such group, and $Group_{ij} = 0$ the remaining legislators. The variable is kept intentionally general as I will use several groups in the empirical analysis.

I start with the above estimation equation (9) and interact its main elements with the *Group*

variable.

$$\begin{aligned}
Absent_{ij} = & \alpha + \gamma_1 Nominal_{ij} \times Reform_{ij} + \gamma_2 Nominal_{ij} \times Reform_{ij} \times Group_{ij} \\
& + \gamma_3 Reform_{ij} \times Group_{ij} + \gamma_4 Nominal_{ij} \times Group_{ij} + \gamma_5 Nominal_{ij} \\
& + \gamma_6 Reform_{ij} + \gamma_7 Group_{ij} + \xi X_{ij} + \psi u_i + \epsilon_{ij}
\end{aligned} \tag{10}$$

γ_1 and γ_2 are the two most relevant coefficients. γ_1 is the marginal reform effect for the subgroup defined by $Group_{ij} = 0$. γ_2 indicates whether the reform effect differs by subgroup. The sum of the coefficients $\gamma_1 + \gamma_2$ reflects the marginal reform effect for $Group_{ij} = 1$.

I will test for difference between running and retiring legislators. The next distinction will be between full-time politicians and legislators engaging in moonlighting. The last distinction is by the number of interest groups. Both choices are directly motivated by the model in which opportunity costs of floor voting and the value of reelection play a role.

6 Results

6.1 Main Results

All regressions are run with ordinary least squares.²⁷ Standard errors are clustered at legislator level because treatment is at individual level and standard errors are most likely correlated at individual level. With 46 legislators in the Upper House, the number of clusters is sufficiently high (Cameron, Gelbach & Miller 2008).

Table 3 present the baseline regression results. In specification (1) and (2) coefficients are estimated using all observations as described in the previous section. In (1) legislator fixed effects are left out, and controlled for in (2). The baseline regression is almost unaffected by this manipulation. The estimated ATET amounts to a reduction in absences by 3.7 percentage points and is significant (the p-value is 0.066). The coefficient of the interaction term *Reform x Nominal* is negative and significant. It reflects a decrease in the probability of being absent by 3 percentage points after the introduction of electronic voting if results are published and available to the public as compared to votes that remain secret. This corresponds to the presence of about one to two additional legislator during nominal votes. The ATET has the expected sign as predicted by the model.

The positive and significant coefficient of *Nominal* suggests that nominal votes had higher absence rates than secrets ones before the reform by 6.8 percentage points. The relatively higher importance of detail votes (which are secret) over total votes might be one explanation for this difference.²⁸

Excused absences can have several reasons as explained above. The two recorded reasons in the data are “Illness” (45% of excused absences) and “Maternity” (11% of excused absences). There is no explicit cause of absence documented for the remaining 45%.²⁹ While the category “Maternity” is non-strategic in nature,³⁰ excused absences without recorded reason might be motivated by strategic shirking considerations. While there is no evidence from Switzerland that would suggest shirking of legislators on sick leave, it is possible in theory. In specifications (3) and (4) I exclude all excused legislators. The estimated effect changes very little from -3 to -2.8 percentage points and remains significant. Indeed, the small change is of little surprise: it is more difficult to exhibit strategic behavior depending on vote types by excused absences. The only way to strategically select between nominal and secret votes would be to only miss days with predominantly secret votes but be present on days with many nominal votes. The similar regression coefficient allows to conclude that strategic excused absences are not driving the main result.

Conditional on covariates, there is no change in absences during secret votes shown by the

²⁷Linearity is a common assumption for DiD estimations. The binary form of the dependent variable might violate this assumption. I rerun the regression using an adjustment for non-linearity for robustness (Blundell et al. 2004)

²⁸During interviews, members of the Upper House mentioned that detail votes are usually strongly debated. I rerun the baseline regression controlling for the vote margin, i.e. the absolute value of the difference between aggregate yes and no votes, to capture the degree of controversy. The results do not change.

²⁹I ran a regression using the dummy *Excused* as dependent variable while controlling for the full set of covariates and legislator fixed effects. The coefficient is close to zero and insignificant suggesting no change in excused absences during nominal votes before and after the reform.

³⁰It is due to one legislator taking her legal maternity leave.

Table 3: PROBABILITY OF ABSENCE

VARIABLES	(1) Baseline	(2) Baseline	(3) Excused excluded	(4) Excused excluded
Reform x Nominal	-0.030** (0.012)	-0.030** (0.012)	-0.028** (0.012)	-0.028** (0.012)
Nominal	0.068*** (0.010)	0.068*** (0.010)	0.069*** (0.010)	0.069*** (0.010)
Reform	-0.008 (0.022)	-0.005 (0.022)	-0.035*** (0.008)	-0.032*** (0.008)
Time	0.017*** (0.002)	0.017*** (0.002)	0.019*** (0.003)	0.019*** (0.003)
Votes per block	-0.004** (0.002)	-0.004** (0.002)	-0.005*** (0.001)	-0.005*** (0.001)
Position in block	-0.005*** (0.001)	-0.005*** (0.001)	-0.006*** (0.001)	-0.006*** (0.001)
Day of Week = Tuesday	0.029*** (0.006)	0.029*** (0.006)	0.028*** (0.005)	0.028*** (0.005)
Day of Week = Wednesday	0.036*** (0.008)	0.036*** (0.008)	0.039*** (0.006)	0.039*** (0.006)
Day of Week = Thursday	0.055*** (0.009)	0.055*** (0.009)	0.043*** (0.007)	0.043*** (0.007)
Day of Week = Friday	0.034 (0.028)	0.034 (0.028)	0.017 (0.019)	0.019 (0.018)
Time trend	-0.005** (0.002)	-0.005** (0.002)	-0.001 (0.001)	-0.002 (0.001)
Constant	23.280** (10.359)	23.863** (10.363)	7.338 (5.003)	7.704 (5.025)
Observations	60,439	60,439	58,947	58,947
Adjusted R-squared	0.019	0.051	0.021	0.045
MP FE	NO	YES	NO	YES
Controls	YES	YES	YES	YES

NOTE: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Ordinary least squares regressions. Dependent variable is 1 if the legislator was absent during the vote, and 0 if he was present. Standard errors clustered at legislator level in parentheses. Legislator fixed effects controlled for in columns (2) and (4). In (3) and (4) excused absences are dropped.

insignificant *Reform* coefficient in columns (1) and (2). However, when excused members are excluded in columns (3) and (4), absences during secret votes decrease as well.³¹ One explanation relates to the electronic voting system facilitating coming back in time for voting during both nominal and secret votes, as explained in the section on identification. It is also the reason why a

³¹Note that the linear *Time trend* becomes insignificant at the same time. What was initially picked up by the time trend, is now attributed to the reform effect on secret votes.

control group is necessary in the empirical setting. This intuition was confirmed in interviews with members of the Upper House.

The signs of the control variables can be explained intuitively. The larger *Time*, i.e., the longer a meeting takes, the more legislators leave the chamber. Absences become less likely if more votes take place during a voting block. Similarly, the later a vote takes place during a voting block, the lower the absence rates. Though the coefficients are small in absolute terms, they go well with the interpretation that if many votes take place after each other, legislators are more likely to finally return to the chamber. On all days of the week absences are higher than on Mondays. The further along the week, the more absences can be witnessed. The linear session time trend is negative and significant in columns (1) and (2) suggesting a reduction in absences over time.³²

6.2 Robustness

Table 4 shows the results of a set of robustness checks. Legislator fixed effects and covariates are always controlled for.

The data panel is largely balanced due to concentrating on a single legislative period. There are three reasons why the panel is not perfectly balanced. I will explain each one of them and provide a robustness check. First, pre-reform data are based on observing presence during votes on video. While the quality of the records is generally good, the videos suffer from some imperfections. Sometimes the camera does not capture the entire chamber. In many cases the chamber's vice president, who's seat is located in the front, is omitted on the records. In total, 1% of pre-reform observations is missing, though there is no imbalance in missing between secret and nominal votes. In contrast, post-reform data have no missing observations by definition since the camera always captures the electronic board in full. The missing observations can be almost fully attributed to the two legislators acting as vice presidents in 2012 and 2013 because the camera captures them seldom. Dropping all observations from these two councilors in column (1) produces a similar coefficient as before (-0.027) which stays significant though at a lower level.³³

Second, chamber presidents and counters have special duties and have - almost by definition - lower absence rates than their peers during this time. During their presidencies and time as vote counters, these legislators' presence during vote is not based on strategic considerations. In column (2) I therefore drop all observations from legislators acting as either presidents or vote counters. The regression coefficient is almost unaffected by this reduction in the sample and gets even slightly more negative (-0.031) .

Third, two legislators dropped out from the Upper House before the reform.³⁴ Their substitutes replaced them after the reform. They consequently lack either pre- or post-reform observations.

³²Lindstädt and Vander Wielen (2011) show with US data that legislators moderate their policies before elections due to a peek in media attention. However, they vote more extremely once monitoring wanes.

³³Even when dropping all eight legislators for whom observations are incomplete yields a significantly negative effect (-0.037).

³⁴One legislator passed away in 2013. The other one stepped down due to deteriorating health.

Though the replacements are members of the same parties and come from the identical canton, they might react differently to monitoring. I drop the four legislators in question in column (3). The main coefficient changes only slightly to -0.029.

The occurrence of voting blocks has already been discussed: while some votes take place independently after a round of debates, other votes are taken in a “block” one after the other. The blocks might consist of exclusively of nominal or secret votes: 72% of blocks in the sample consist of secret votes only, and 19 % of nominal votes only. The remainder of 9% contains both nominal and secret votes. Since absences in voting blocks are correlated, spill-over effects from one type of vote to the other within the same block are possible in theory. E.g., lower post-reform absences during nominal votes might decrease absences during secret ones if the two types of votes are taken one after the other. This would bias the DiD coefficient towards zero. A possible test is to run the regressions based on a sample of voting blocks containing either secret votes or nominal ones, but not the two of them. In column (4) I drop the 9% of mixed blocks reducing the sample to below 50,000. The coefficient becomes even more negative (-0.04) and stays significant. Potentially, the above-described spill-over mechanisms were at play and have led to a too small coefficient.

In theory it is possible that electronic voting affects the way bills are proposed such that bills being discussed differ systematically before and after the reform. Similarly to Benesch, Bütler and Hofer (2015) I restrict my sample to bills that have been started before the reform in 2014 and drop 348 votes from post-reform bills. This reduces the sample size and disregards a sizeable share of post-reform observations. Regardless of this manipulation, the main coefficient in column (5) is negative and significant. Its size is changed to -0.024.

Table 4: PROBABILITY OF ABSENCE - ROBUSTNESS

VARIABLES	(1) Missings dropped	(2) Presidents excluded	(3) New members excluded	(4) Blocks	(5) Old Bills
Reform x Nominal	-0.027* (0.014)	-0.031** (0.013)	-0.029** (0.012)	-0.040** (0.015)	-0.024** (0.011)
Nominal	0.066*** (0.010)	0.074*** (0.010)	0.067*** (0.010)	0.089*** (0.013)	0.065*** (0.010)
Reform	-0.005 (0.027)	-0.006 (0.024)	-0.006 (0.022)	-0.005 (0.023)	-0.004 (0.024)
Constant	27.947** (12.754)	27.871** (11.007)	23.315** (10.426)	24.208** (10.492)	26.265** (11.241)
Observations	47,464	55,409	58,018	49,939	44,457
Adjusted R-squared	0.057	0.052	0.050	0.055	0.053
MP FE	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES

NOTE: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Ordinary least squares regressions. Dependent variable is 1 if the legislator was absent during the vote, and 0 if he was present. Standard errors clustered at legislator level in parentheses. Legislator fixed effects and covariates are always controlled for. In (1) all observations from legislators with missing observations are excluded. In (2) all observations from presidents and vote counters are excluded. In (3) all observations from two substitute legislators are dropped. In (4) voting blocks including both secret and nominal votes are excluded. In (5) only bills started before 2014 are included.

6.3 Heterogeneous Effects

In this section, I analyze differential effects for groups of legislators potentially differently affected by monitoring. The mechanism at work runs through reelection prospects. Some groups of legislators are more dependent on getting elected for another terms while others have alternative opportunities. Three subgroups are distinguished. First, from the model differential effects can be expected depending on whether legislators were candidates in the 2015 election or decided to retire. Next, full-time politicians and legislators with an outside occupation in the private sector are checked for differences. While the former are reliant on getting reelected, moonlighters might have alternative careers. Last, the number of interest groups of a legislator is taken into account. While interest groups take time to deal with, they might be valuable in case the political career is terminated.

6.3.1 Running for Reelection

The literature documents differential behavior of legislators contained by reelection prospects. There is (partial) evidence for more shirking towards the end of the political career by voting against constituencies' interests and (robust) evidence for reducing presence in parliament (e.g., Lott 1990; Rothenberg & Sanders 2000).

Model Prediction 2 suggests that better monitoring should affect incumbents running for reelection and those in their last term differently. Politicians aiming at continuing their political careers have to cater to their voters' interests. Legislators not facing reelection constraints, in contrast, should be less susceptible to monitoring.

The expectation thus is that the change in the voting procedures should have a stronger effect on legislators standing for reelection than on legislators terminating their political careers at the end of the legislative period. In total 34 members of the Upper House were candidates for the next election, whereas 12 decided to step down.

Retirement can take two forms: voluntary or in anticipation of a potential defeat at the approaching elections. Some legislators devote their lives to political work, while others utilize political offices as stepping stones for non-political careers.^{35,36} In the case of the Swiss Upper House the notion of career politicians seems to dominate. Office-holders not running in the 2015 election were between 63 and 70 years old in 2015. On average, they were ten years older than legislators running for the next term. This suggests that legislators are more likely going into voluntary retirement. However, an often used argument in the literature states that legislators anticipating electoral defeat are more likely to retire. Or if legislators retired because they disliked transparency this would affect the estimates. For robustness, I therefore use age in 2015 as an instrument for retirement.

The variable *Retiring* takes on value 0 if a legislator stood for reelection in 2015, and 1 otherwise. It is interacted with the standard DiD estimation equation such that a heterogeneous effect between

³⁵Mattozzi and Merlo (2008) make this distinction between what they call "career politicians" and individuals with "political careers".

³⁶E.g., Diermeier, Keane and Merlo (2005) for the US Congress.

candidates and retiring legislators can be tested for. Observations from the two members leaving the Upper House before 2014 are dropped because there is no retirement decision involved.

Comparing pre-reform absences among the two groups, no significant difference can be found: both miss around 14% of secret and 19% of nominal votes on average. Table 5 shows the regression results. I first repeat the baseline regression with the reduced sample to ensure that sample selection does not affect the results. As column (1) shows, dropping the two legislators has little effect on the main coefficient (-0.028).

Column (2) shows the estimation with heterogeneous effects. The coefficient of the DiD interaction *Reform x Nominal* can be interpreted as the reform effect for legislators running for reelection (*Retiring* = 0). It is significantly negative: incumbents standing for the 2015 election reduce their absences during nominal votes by 4.2 percentage points. The effect is considerably larger (i.e., more negative) than the baseline effect of -2.8 percentage points in the pooled sample in column (1). It is therefore the subsample of politicians exposed to the threat of (no) reelection who drive the average result.

The coefficient of the triple interaction has a negative and significant value. It means that legislators standing for reelection reduce their absences during nominal votes by 5.5 percentage points more than legislators retiring. The marginal reform effect for retiring politicians is the sum of the coefficients of the triple interaction and the DiD effect. It is not significantly different from zero, indicating no effect of the reform on retiring politicians (results in the Appendix).

The results are robust to the exclusion of observations from the two new members who entered the Upper House as substitutes in 2014. This not only balances the panel but also drops two members who could have been expected to stand for reelection (in fact, they both did). The results are in column (3). In column (4) I exclude observations from excused absences. The marginal reform effect for candidates remains significant and is of similar size as before (-0.037). In column (5) retirement is instrumented with age which is an exogenous variable. All interactions with retirement are instrumented by interactions of the same variable with age. Results change very little and are thus not driven by the endogeneity of the retirement decision.

The results are in line with the theoretical expectation that politicians facing reelection constraints are more susceptible to monitoring. In contrast, legislators who end their political career are not concerned with punishment by their constituencies. The result thus confirms the model prediction that legislators in their last term behave like lame ducks and do not react to incentives related to reelection prospects.

Table 5: HETEROGENEOUS EFFECTS: RUNNING FOR REELECTION

VARIABLES	(1) Baseline	(2) All	(3) New members excluded	(4) Excused excluded	(5) IV
Reform x Nominal	-0.028** (0.012)	-0.042*** (0.014)	-0.043*** (0.013)	-0.037** (0.014)	-0.030*** (0.008)
Retiring x Reform x Nominal		0.055** (0.027)	0.057** (0.027)	0.046* (0.023)	0.036* (0.022)
Retiring x Reform		-0.002 (0.021)	-0.003 (0.021)	-0.007 (0.017)	-0.017 (0.013)
Retiring x Nominal		-0.009 (0.024)	-0.009 (0.024)	-0.012 (0.019)	0.022 (0.016)
Reform	-0.004 (0.022)	-0.003 (0.023)	-0.006 (0.023)	-0.031*** (0.009)	0.001 (0.007)
Nominal	0.066*** (0.010)	0.069*** (0.012)	0.069*** (0.012)	0.070*** (0.012)	0.047*** (0.006)
Retiring		0.025* (0.014)	0.099*** (0.011)	0.025* (0.013)	0.005 (0.080)
Observations	59,252	59,252	58,018	57,781	59,252
Adjusted R-squared	0.050	0.050	0.050	0.043	0.050
MP FE	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES

NOTE: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Ordinary least squares regressions. Dependent variable is 1 if the legislator was absent during the vote, and 0 if he was present. *Retired* is 1 if the legislator does not run for reelection in 2015, and 0 else. Standard errors clustered at legislator level in parentheses. Two legislators leaving the Upper House before 2014 are excluded. Legislator fixed effects and covariates are always controlled for. (1) repeats the baseline regression. In (2) heterogeneous effects are estimated. In (3) all observations from two substitute legislators are dropped. In (4) excused absences are dropped. (5) shows an IV regression using *Age* in 2015 as instrument for retirement from politics.

6.3.2 Moonlighters and Full-Time Politicians

All legislators have to provide information about their outside occupation. 14 original members of the Upper House and one substitute are full-time politicians. They are classified according to official documentations and information on their personal websites. The information has been confirmed through interviews with legislators.³⁷

Before the reform full-time politicians miss around 13% of all nominal votes on average. This is significantly less than the 21% among moonlighting legislators. During secret pre-reform votes the trend is similar: moonlighters miss about 16% of all votes in contrast to 9% by full-time politicians. Without monitoring, full-time politicians put more time into voting than politicians with outside occupation. It goes well with the notion that some legislators have dedicated their careers to politics and thus put more effort into floor voting.³⁸

The marginal reform effect for full-time politicians is negative and significant (column 1): full-time legislators reduce their absences during nominal votes significantly by 5.1 percentage points. The triple-interaction coefficient is positive though insignificant. Testing for the marginal reform effect in the subgroup of moonlighting politicians reveals no significant impact of monitoring on this subgroup.

Dropping the two newest members (column 2), or dropping all excused absences (column 3) yields an even more negative treatment effect among career politicians. The triple interaction becomes significant in column (2), suggesting a difference in the marginal reform effect between full-time politicians and moonlighters: politicians with outside occupations do not change their absences during nominal relative to secret votes.

The finding adds interesting insights about the behavior of legislators depending on their outside options. Incumbents who have dedicated their lives to political careers, depend more strongly on reelection. Serving in the Upper House has become their main profession and alternative careers outside politics are not immediately available. This is a potential interpretation of why career politicians not only shirk less a priori but also react more strongly to monitoring. Moonlighting politicians, however, have an outside occupation they can focus on if voters choose not to reelect them. They are thus less reliant on getting reelected.

³⁷ While in some countries the declaration of moonlighting wages is mandatory, e.g., in Germany or Italy, this is not the case in Switzerland. Outside wages are not being communicated.

³⁸ These descriptives are compatible with Fedele and Naticchionis' (2015) finding that "public-fit" politicians are more likely present during votes than "private-fit" ones.

Table 6: HETEROGENEOUS EFFECTS: MOONLIGHTING AND FULL-TIME POLITICIANS

VARIABLES	(1) Baseline	(2) New members excluded	(3) Excused excluded
Reform x Nominal	-0.051*** (0.019)	-0.060*** (0.016)	-0.053*** (0.019)
Moonlight x Reform x Nominal	0.030 (0.024)	0.042* (0.022)	0.036 (0.024)
Moonlight x Reform	-0.023 (0.023)	-0.026 (0.023)	-0.012 (0.016)
Moonlight x Nominal	0.004 (0.019)	0.004 (0.019)	-0.008 (0.020)
Reform	0.011 (0.030)	0.011 (0.030)	-0.024* (0.012)
Nominal	0.065*** (0.015)	0.065*** (0.015)	0.075*** (0.016)
Moonlight	0.043** (0.020)	0.103*** (0.013)	0.029** (0.013)
Constant	23.832** (10.364)	22.292** (10.432)	7.675 (5.029)
Observations	60,439	59,205	58,947
Adjusted R-squared	0.051	0.051	0.045
MP FE	YES	YES	YES
Controls	YES	YES	YES

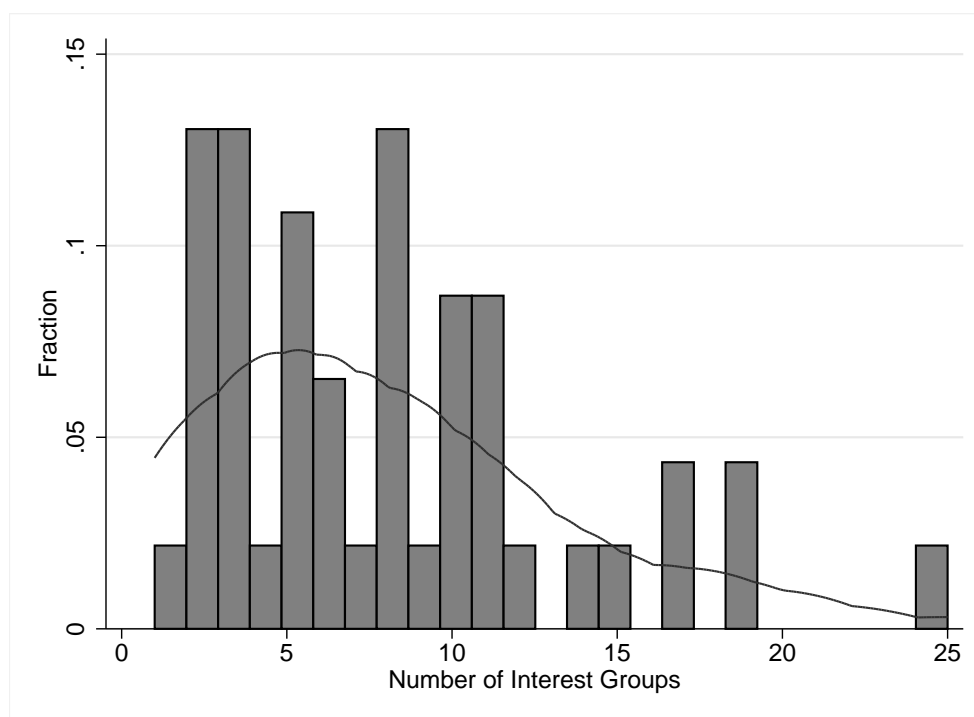
NOTE: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Ordinary least squares regressions. Dependent variable is 1 if the legislator was absent during the vote, and 0 if he was present. *Moonlight* is 1 if a legislator has an occupation in the private sector, and 0 for full-time politicians. Standard errors clustered at legislator level in parentheses. Legislator fixed effects and covariates are always controlled for. In (2) all observations from two substitute legislators are dropped. In (3) excused absences are dropped.

6.3.3 Number of Interest Groups

Interest groups have an impact on legislative voting (e.g., Giger and Klüver (2016) in the Swiss context). While some explicitly want to impact legislators' votes, they all demand time and effort.

Legislators in the Swiss parliament are legally obliged to disclose their interest groups at the beginning of each calendar year. The information is publicly available online in PDF format. I collected the individual stock of declared interest groups for the years 2012 to 2015. The variable *Interestgroups* is defined as the number of officially declared interest groups per member of the Upper House in 2012.³⁹ Fixing the variable at the beginning of the legislative term has the advantage that potential strategic adjustments in the number of interest groups can be discarded. I will deal with such adjustments below. Figure 7 shows the variable's histogram and density plot by each legislator in the Upper House. While many legislators have only few interest groups, some declare as many as 25. Both average and median are around 7.5 interest groups.

FIG. 7: NUMBER OF INTEREST GROUPS



NOTE: Distribution of yearly declared number of interest groups per legislator in the Swiss Upper House. The y-axis depicts the fraction of observations. Source: Official declaration of interest groups available on the parliament's website www.parlament.ch.

For the regressions, the variable *Interestgroups* is interacted with the rest of the DiD model to find heterogeneous effects depending the declared number of interest groups.

Table 7 shows the regression results. The first specification shows a baseline model. Legislators

³⁹The two legislators joining the Upper House in 2014 are allotted their respective 2014 values.

without interest groups have an average treatment effect of -6.5 percentage points. Increasing the number of interest groups by 1, increases the probability of absence at nominal votes by 0.4 percentage points. Since the effect is potentially non-linear, I redefine the variable *Interestgroups* to its natural logarithm. The effect in column (2) is significant. The logarithm specification yields similar results: a 10% increase in the number of interest groups leads to 4 percentage points increase in absences.

In specifications (3) to (6) I substitute the continuous measure of interest groups with indicators related to the distribution of interest groups. The goal is to find out which part of the distribution is driving the results. In column (3) the dummy takes on value 0 if a legislator has three or fewer interest groups (below first quartile), and 1 else. In column (4) interest groups above the median of 7.5 are classified as 1, and 0 below. In column (5) values above the third quartile of 11 is coded as a 1, and 0 below. In column (6) the indicator takes on value 1 if the number of interest groups exceeds the 90th percentile of 17, and is 0 else. On average, the interest group indicator reflects a higher number of interest groups if its value is 1.

Before the reform absences during secret votes were similar for legislators with more or less than three interest groups (about 14%). But during nominal votes, legislators with relatively more interest groups had lower absence rates (17%) compared to councilors with few interest groups (22%). Column (3) in Table 7 displays the regression results. The marginal effect of the reform in the subgroup of legislators with fewer interest groups is significantly negative. The decrease in absences for legislators with up to three interest groups amounts to 6.8 percentage points which is more than double the average treatment effect estimated for the full sample. Politicians with few interest groups consequently reduce absences during nominal votes to a level similar to legislators with more interest groups. The triple interaction *Interestgroups x Reform x Nominal* is significantly positive in columns (3) meaning that the marginal reform effect differs between the two subgroups. Indeed, testing for significance of the marginal reform effect in the subgroup above the 25th percentile, yields an insignificant result.

The marginal reform effect for subgroups with fewer interest groups becomes less negative the higher the percentile defining the interest group variable (columns (4) to (6)). In absolute terms the effect is largest for legislators with very few interest groups. In columns (5) and (6) there is no significant difference in the marginal reform effect in the subgroups with many and fewer interest groups. However, the marginal reform effect is also insignificant.

Could any of the above be due to an adjustment in the number of interest groups? Assuming a negative “pure” reform effect of monitoring, the result might be rationalized by an adjustment in the number of interest groups which would counteract the monitoring effect. E.g., if legislators with many interest groups even increased their number and this caused them to have less time for voting, the total marginal reform effect of monitoring and adjustment of interest groups might be zero. Any such changes as response to the increase in monitoring would be expected between the reported numbers of interest groups between 2013 and 2014. The number for 2013 was reported before the transparency bill was ratified such that no adjustment would be expected for 2013.

I run a t-test of the number of interest groups reported in 2013 and 2014 by year. Though the average number increases from 8.6 to 9.9, the change is insignificant.⁴⁰ I also run t-tests of the change in the number of interest groups between 2013 and 2014 by the percentile indicator variables used in the above regression analysis. None of the t-tests turns out to be significant. This means that changes in the number of interest groups are not significantly different in the subgroups characterized by few or many interest groups.

The results allow concluding that the reduction in absences during nominal votes is particularly due to legislators with relatively few interest groups. Legislators with many interest groups, in contrast, do not adjust their effort during votes. Having many interest groups might mean that no more additional time is available to be invested into voting. Potentially, these interest groups even demand the politicians' presence in chamber to be able to influence political outcomes. As insiders to the political process they might possess information and depend less on formal monitoring. Legislators with few interest groups, on the other hand, have the capacity to increase their presence in chamber.

⁴⁰Considering the entire legislative period, the number of interest groups reported is significantly larger after the reform than before. This trend might be due to many reasons, like time effects, or even occur randomly. The really interesting change is therefore the one around the reform from 2013 to 2014.

Table 7: HETEROGENEOUS EFFECTS: NUMBER OF INTEREST GROUPS

VARIABLES	(1) All	(2) Logs	(3) p25	(4) p50	(5) p75	(6) p90
Reform x Nominal	-0.065*** (0.019)	-0.104*** (0.028)	-0.068*** (0.020)	-0.062*** (0.014)	-0.038*** (0.013)	-0.030** (0.012)
Interestgroups x Reform x Nominal	0.004** (0.002)	0.040** (0.015)	0.053** (0.024)	0.063*** (0.022)	0.044 (0.032)	0.008 (0.068)
Interestgroups x Reform	0.002 (0.002)	0.009 (0.015)	0.017 (0.019)	0.007 (0.020)	0.026 (0.033)	0.023 (0.058)
Interestgroups x Nominal	-0.004** (0.002)	-0.035*** (0.013)	-0.051** (0.021)	-0.048** (0.019)	-0.035 (0.026)	0.001 (0.057)
Reform	-0.023 (0.025)	-0.021 (0.029)	-0.017 (0.023)	-0.009 (0.021)	-0.011 (0.020)	-0.007 (0.022)
Nominal	0.101*** (0.018)	0.131*** (0.026)	0.106*** (0.019)	0.092*** (0.014)	0.074*** (0.012)	0.068*** (0.011)
Interestgroups	-0.005*** (0.002)	-0.037*** (0.011)	-0.086*** (0.015)	-0.084*** (0.016)	-0.105*** (0.029)	-0.104** (0.051)
Constant	23.717** (10.375)	23.826** (10.368)	23.853** (10.364)	23.844** (10.363)	23.812** (10.362)	23.816** (10.381)
Observations	60,439	60,439	60,439	60,439	60,439	60,439
Adjusted R-squared	0.052	0.052	0.052	0.052	0.052	0.051
MP FE	YES	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES	YES

NOTE: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Ordinary least squares regressions. Dependent variable is 1 if the legislator was absent during the vote, and 0 if he was present. *Interestgroups* is the officially reported number of interest groups for each legislator in 2012. Standard errors clustered at legislator level in parentheses. Legislator fixed effects and covariates are always controlled for. In (2) *Interestgroups* is the variable's logarithm. In (3) to (6) the binary variable is 1 if the number of interest groups is above the p^{th} percentile and 0 else, with $p=25$ in (3), $p=50$ in (4), $p=75$ in (5), and $p=90$ in (6).

6.4 Discussion and Consequences of Monitoring

The analysis yields a robust result indicating less shirking once attendance can be monitored. The results are in line with the notion that legislators depending more strongly on reelection, e.g., because of career concerns, reduce absences by more than the other other councilors. The mechanism through the threat of (no) reelection is theoretically appealing, especially since media reporting of absence statistics is most likely going to have an impact on voters.

In addition, interviews with Swiss party officials have revealed that parties themselves care about attendance. They have a preference for a cohesive appearance of their members during votes which also includes united presences during votes. While voters and parties as the legislators' principals can have competing interests with respect to voting outcomes, their stance over participation seems united. In this context, participatory shirking is unlikely to be driven by competing principals.

The analysis remains silent about the desirability of more monitoring in terms of welfare. In the model monitoring had an unambiguously positive effect on accountability towards voters. However, more attendance during votes goes hand in hand with forgone politicians' rents. One important question to ask is whether more attendance during votes is efficient in the sense of affecting voting outcomes.

Nominal votes in Switzerland virtually always get accepted. The average share of yes votes during total votes amounts to 95%. Seizable voting margins, i.e., the difference between yes and no votes, constitute a logical consequence. Total votes, for instance, have average vote margins of 33 votes. Running t-test of both vote margins and the aggregate number of yes votes yields an interesting result: both significantly increase by roughly two. It means that the additional turnout of two legislators per vote was in favor of accepting the respective total votes. In other words, the outcome does not change since the same policies get implemented. However, some legislators have to invest more time into voting which clearly makes them worse off.

7 Concluding Remarks

Do individuals bound by principal-agent relationships react to incentives from differences in monitoring technologies? Using the example of legislators voting under differential monitoring technologies, this paper shows that individuals react to such incentives. If legislators' attendance rates can be tracked, they are more likely to vote compared to situations when their attendance is not publicly disclosed.

My research contributes to the understanding of parliamentary voting procedures on political outcomes. While the predominant goal of electronic voting was the eradication of counting mistakes during votes, it also changed the way legislators vote. Not only does the rationale of electoral accountability drive them to put more effort into their parliamentary work. But also parties can control their members better if institutionalized monitoring is available.

Changing the outcome of the vote by few additionally present legislators is unlikely if vote

margins are large. In conclusion, if vote attendance is a goal in itself, more monitoring can be a way to achieve that goal. But it leaves doubt over the efficient use and effectiveness of time resources.

The estimation of the treatment effect was only possible due to the reform happening during the legislative period. Candidate selection effects can thus be ruled out in this analysis. For the future, the transparent setting might also affect who is willing to run for office and lead to different long-term effects.

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Appendix

Data sources

Table 8: OVERVIEW OF VARIABLES AND DATA SOURCES

Variable	Description	Source(s)
Absences	Votes before 2014	Videos provided by Parliamentary Services
	Final votes before 2014	Taken from Benesch, Bütler and Hofer (2015)
	Nominal votes since 2014	PDFs provided by Parliamentary Services
	Other votes since 2014	Videos provided by Parliamentary Services
Gender, birthday, party, party group, canton	Obligatory MP personal information	Parliament homepage
Academic title, military title, and civil status, number of children	Voluntary MP private information	Parliament homepage
Interest groups	Number of disclosed interest groups	Register of interest groups 2012-2015
Profession	Self-reported profession	Register of interest groups 2012-2015

NOTE: This table provides an overview of the variables used with a short variable description, and the source from which it was retrieved.

Academic title, military title, and civil status could vary over time. These variables were collected in September 2015 and thus reflect the status at this point in time. Civil status and number of children are voluntary information given by legislators.

Member mutations

Table 9: MP MUTATIONS OVER TIME

Name	Date exit	Replaced by	Date entry
Jenny, This	13 February, 2014	Hefti, Thomas	3 March, 2014
Freitag, Pankraz	5 October, 2013	Hösli, Werner	16 June, 2014

NOTE: Source: Parliament homepage.

Tables

Table 10: HETEROGENEOUS EFFECTS: RUNNING FOR REELECTION

VARIABLES	(1) Baseline	(2) All	(3) New members excluded	(4) Excused excluded
Reform x Nominal	-0.028** (0.012)	0.013 (0.023)	0.013 (0.023)	0.008 (0.018)
Reform	-0.004 (0.022)	-0.006 (0.025)	-0.008 (0.025)	-0.038** (0.015)
Nominal	0.066*** (0.010)	0.059*** (0.021)	0.060*** (0.021)	0.058*** (0.015)
Running		-0.025* (0.014)	-0.099*** (0.011)	-0.025* (0.013)
Running x Reform x Nominal		-0.055** (0.027)	-0.057** (0.027)	-0.046* (0.023)
Running x Reform		0.002 (0.021)	0.003 (0.021)	0.007 (0.017)
Running x Nominal		0.009 (0.024)	0.009 (0.024)	0.012 (0.019)
Constant	24.801** (10.358)	24.802** (10.357)	23.316** (10.426)	7.594 (4.964)
Observations	59,252	59,252	58,018	57,781
Adjusted R-squared	0.050	0.050	0.050	0.043
MP FE	YES	YES	YES	YES
Controls	YES	YES	YES	YES

NOTE: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Ordinary least squares regressions. Dependent variable is 1 if the legislator was absent during the vote, and 0 if he was present. Standard errors clustered at legislator level in parentheses. Legislator fixed effects are always controlled for.