Who is the Ultimate Boss of Legislators: Voters, Special Interest Groups or Parties?*

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Abstract: Politicians have multiple principals. We investigate the weights that politicians put on the revealed preferences of their constituents, special interest groups and party when deciding on legislative proposals. Preferences of constituents, special interest groups and parties are directly observed in our setting and they are positively correlated among each other. The empirical findings suggest that constituent preferences are assigned the lowest weight. Holding constant the preferences of other principals, constituent preferences are assigned a weight of only 10.0%. Party preferences are assigned the highest weight of all principals and special interest groups lie in between. A politician's personal ideology plays no substantial role in legislative decisions. We explore conflict among principals as well as heterogeneity among politicians. Our results cast doubt on the empirical relevance of the median voter model and suggest that more principals need to be considered to explain legislative decisions.

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I. INTRODUCTION

The electoral success of a legislator does not only depend on the extent to which voters perceive the legislator's proposals and decisions align with their preferences, but also on campaign support provided by special interest groups and party members. As a consequence, special interest groups and parties can also push legislators to align with their preferences. In other words, legislators serve as common agents of multiple principals. Moreover, the preferences of these principals may align or conflict with each other, i.e., principals can agree or disagree on their stances regarding specific legislative proposals.

While it is theoretically evident that common agency is relevant in politics, it is empirically challenging to study multiple principals simultaneously. One reason is that the preferences of voters, special interest groups, and parties are usually unobservable for specific legislative proposals. Even if preferences of different principals can be derived or approximated, they often cannot be directly compared. To overcome these challenges, we exploit a unique setting for the Upper House of Parliament in Switzerland, which allows us to directly observe the preferences of voters, special interest groups and parties for specific legislative proposals. Preferences of all three principals are measured on the same scale. Moreover, we also observe the actual voting behavior of members of Parliament (MPs) on the same legislative proposals. This allows us to estimate the weights that MPs assign to the three principals in their decisions as well as the weight they put on their personal preferences as the unexplained component of legislative decisions. To the best of our knowledge, this is the first paper that estimates the relative importance that the revealed preferences of voters, special interest groups and parties have on legislative decisions.

Our results indicate that all principals matter in explaining how MPs vote on legislative proposals. However, the weights MPs assign to their different principals differ to a substantial degree. The weight MPs put on party preferences is about seven times higher than the weight they put on voters' preferences, and the weight they put on special interest group preferences

is about double the weight they put on voters' preferences. We also show that it is critical to investigate preferences of all principals jointly because their preferences may either be aligned or differ (e.g., for some legislative proposals special interest groups may have the same preferences as voters, while in other cases they are in conflict with each other). Empirically, preferences of all principals are positively correlated, though instances of conflict do arise. The positive correlation between principals' preferences implies that the omission of one principal will induce a positive bias on the weight that MPs assign to other principals. In particular, our results suggest that when the preferences of special interest groups and parties are not accounted for, the weight that MPs assign to voters' preferences is overestimated.

By jointly investigating preferences of voters, special interest groups and parties, our empirical model can correctly explain 73.5% of all legislative decisions in our sample. Moreover, if all principals are aligned, our model accurately predicts over 94.7% of all legislative decisions. That is, in situation where all principals are aligned, the personal preference/ideology of the MPs plays a comparatively small independent role.

Our results cast doubt on the empirical relevance of the median voter model (Downs 1957). Voters preferences do play a role for legislative decisions (see Scervini 2012; Portmann and Stadelmann 2017, Stadelmann 2017) but their relevance is small in comparison to special interest groups and parties. To understand and model actual political behavior, more principals need to be considered. Politicians do not systematically align their decisions with the median voter's preferences.

The remainder of this article is structured as follows: Section II discusses the related literature. Section III develops a theoretical framework. Section IV describes the institutional background. Section V introduces the data and the econometric model. Results are presented in Sections VI and VII. Section VIII presents concluding remarks.

II. RELATED LITERATURE

We contribute to three bodies of literature: the literature on the representation of voters' preferences on legislative decisions; the literature on the role and importance of special interest groups; and that on party discipline in the legislative process.

Legislative decisions in democracies are usually made by majority rule. The majority rule is probably the most widely accepted decision rule for social choices.[1] The majority rule's prevalence in political decisions has motivated scholars to integrate the position of the majority into a vast number of economic models.[2] Classical theory suggests an elegant mapping from voter's interests to political representation and, subsequently, to policies: The well-known result of spatial competition along a single policy dimension is convergence of legislators' positions to the median voter under two party competition (see Duverger 1954; Downs 1957). However, the literature on legislative shirking shows that systematic deviations from voters' interests exist and theoretical requirements for Downsian convergence are rarely met (see Kau and Rubin 1979; Peltzman 1984; Alesina 1988; Gouveia and Masia 1998; Persson and Tabellini 2000; Gerber and Lewis 2004; Ågren et al. 2007; Potrafke 2013; Portmann and Stadelmann 2017). We directly contribute to the discussion on the representation of the median voter (see Grofman 2004; Powell 2000; Powell 2009; Golder and Stramski 2010; Stadelmann et al. 2012; Padovano 2013). Specifically, we highlight the relevance of other principals, such as parties and interest groups which may lead to divergence.[3]

Theoretical and empirical contributions also investigated the possibility that politicians react to stimuli other than the majority's preferences. Such behavior leads to diverging results

[1] May (1952) demonstrates that any decision function which "is not based on simple majority decision [...] will either fail to give a definite result in some situation, favor one individual over another, favor one alternative over the other, or fail to respond positively to individual preferences."
[2] Majority decisions through referenda may even lead to higher welfare than decisions based on cost benefit analyses by a planner (see Osborne and Turner 2010).
[3] Grofman (2004) and Padovano (2013) offer a critical assessment of spatial voting models and discusses potential alternatives and complements.

from spatial predictions. Two additional competing principals which aim to influence policies are special interest groups (see Becker 1983; Denzau and Munger 1986; Snyder 1992; Stratmann 1995; Houser et al. 2011; Bombardini and Trebbi 2011; Bertrand et al. 2014; Giger and Klüver 2016; Stadelmann et al. 2016) and political parties (see Alesina and Rosenthal 1989; Ansolabehere et al. 2001; Carey 2007; Budge et al. 2012), as well as diverse subsets of the constituents that are potentially represented by parties (see Jung et al. 1994; Levitt 1996; Golder and Stramski 2010). Moreover, legislators may only partially respond to constituents' demands because of personal ideological differences or valence (see Levitt 1996; Groseclose 2001; Zakharov 2008).

Regarding special interest groups, a large literature covers lobbying a on a theoretical level (e.g. Kau et al. 1982; Persson and Tabellini 2000; Mueller 2003; Hillman 2009; Gilens and Page 2014; Balles et al. 2018.). One of the most important starting points is the modelling framework introduced by Bernheim and Whinston (1986), which was later adopted and modified by Grossman and Helpman (1994) to study the consequences of lobbyism. These models have since then become basis for several studies on lobbyism (e.g. Persson 1998; Grossman and Helpman 1996). A strand of literature considers the influence of special interest groups to be the process of communication between a special interest group and a policy maker and hence deals with models of strategic – either costly or costless – information transmission (see Lohmann 1995; Austen-Smith and Banks 2002).

Ideology and party preferences may affect legislative decisions by individual members of Parliament (e.g. Alesina 1988; Grofman et al. 1990; Levitt 1996; Besley and Coate 1997; Budge and McDonald 2007; Giger et al. 2020). Considering the procedural aspect of elections puts party votes at the center of attention too. The democratic process allows parties to claim voter endorsement for all policy positions that they associate with. Indeed, parties tend to claim support for their position, regardless of which policy space they operate in, and demand party discipline from their members (see McCarty et al. 2001). Alignment with party preferences can

also be important for future career perspectives. Parties may affect how politicians represent their voters and who gets political credit for success or is blamed for failures (see Lijphart 1994; Cox 1997; Persson and Tabellini 2000).

III. THEORETICAL CONSIDERATIONS

To structure the empirical work, in this section we develop a simple model of the legislative decision faced by an MP.

Suppose that MP i considers four different sets of preferences when he/she decides on a piece of legislation l: (i) Preferences of his/her constituency; (ii) Preferences of his/her special interest groups; (iii) Preferences of his/her party; and (iv) His/her personal preferences or ideology. Specifically, suppose that the utility of MP i regarding legislative proposal l is a weighted average of the utilities of the four principals, i.e.:

$$U_{il} = \sum\nolimits_{p=C,S,P,I} \beta^p U_{il}^p(v_{il}) \tag{1}$$

where $v_{il} \in \{0,1\}$ is the final vote of MP i on legislative proposal l, with $v_{il} = 0$ indicating that the MP votes against the proposal and $v_{il} = 1$ that he/she votes in favor of the proposal. β^C is the weight that the MP puts on the constituency, β^S the weight of special interest groups, β^P the weight of the party and $\beta^I = 1 - \beta^C - \beta^S - \beta^P$ is the weight on his/her own preferences.[4] The utility of principal $p = C, S, P, I$ is given by:

$$U_{il}^p(v_{il}) = X_{il}^p d(v_{il}, 1) + \left(1 - X_{il}^p\right) d(v_{il}, 0) \tag{2}$$

where $d(x, y) = 0$ if $x = y$ and $d(x, y) = -1$ if $x \neq y$, and $X_{il}^p \in [0,1]$ is a function of the share of principal p that prefers to pass the proposal over the status quo. For example, X_{il}^C could be the share of voters that prefer to pass the proposal. Alternatively, we can define $X_{il}^C = 1$ if more than half of the voters prefer to pass the proposal and $X_{il}^C = 0$, otherwise. We interpret

[4] Since utility functions are defined up to an affine transformation, there is no loss of generality in constraining the weights to sum to one.

$X_{il}^I \in [0,1]$ as the personal ideology of the MP. The higher the value of X_{il}^I, the more ideologically aligned the MP is with the proposal.

Maximizing U_{il} with respect to v_{il} yields the optimal voting decision of MP i regarding legislative proposal l:

$$v_{il}^* = \begin{cases} 1 & if\ \beta X_{il} + (1 - \beta\mathbf{1})X_{il}^I > \frac{1}{2} \\ 0 & if\ \beta X_{il} + (1 - \beta\mathbf{1})X_{il}^I \leq \frac{1}{2} \end{cases} \tag{3}$$

where $\beta = (\beta^C, \beta^S, \beta^P)$, $X_{il}' = \left(X_{il}^C, X_{il}^S, X_{il}^P\right)$, $\mathbf{1}' = (1,1,1)$, $\beta X_{il} = \sum_{p=C,S,P} \beta^p X_{il}^p$ and $\beta\mathbf{1} = \sum_{p=C,S,P} \beta^p$.

We distinguish between X_{il}' and X_{il}^I because X_{il}^I is only observable for the MP but not for the econometrician. Therefore, suppose that X_{il}^I has a cumulative distribution function F with $F(0) = 0$ and $F(1) = 1$. Then, the probability that MP i votes in favor of legislative proposal l is given by:

$$Pr(v_{il}^* = 1) =$$

$$= Pr\left(I_{il} > \frac{\frac{1}{2} - \beta X_{il}}{1 - \beta\mathbf{1}}\right) = \begin{cases} 1 & if\ \beta X_{il} \geq \frac{1}{2} \\ 1 - F\left(\frac{\frac{1}{2} - \beta X_{il}}{1 - \beta\mathbf{1}}\right) & if\ -\frac{1}{2} + \beta\mathbf{1} < \beta X_{il} < \frac{1}{2} \\ 0 & if\ \beta X_{il} \leq -\frac{1}{2} + \beta\mathbf{1} \end{cases} \tag{4}$$

Comparative Statics

From (4), it is easy to deduce the effect that each principal has on the voting behavior of the MP. Assuming that F is differentiable, we obtain:

$$\frac{\partial Pr(v_{il}^* = 1)}{\partial X_{il}^p} = \begin{cases} 0 & if\ \beta X_{il} \geq \frac{1}{2} \\ F'\left(\frac{\frac{1}{2} - \beta X_{il}}{1 - \beta\mathbf{1}}\right)\frac{\beta^p}{1 - \beta\mathbf{1}} & if\ -\frac{1}{2} + \beta\mathbf{1} < \beta X_{il} < \frac{1}{2} \\ 0 & if\ \beta X_{il} \leq -\frac{1}{2} + \beta\mathbf{1} \end{cases} \tag{5}$$

for $p = C, S, P$. Thus, as the share (or a function of it) of the MP's constituents, special interest groups, or party that prefer the proposal over the status quo rises, the probability that the MP votes in favor of the proposal rises too. Moreover, from (5) we have:

$$\frac{\frac{\partial Pr(v_{il}^{*}=1)}{\partial X_{il}^{p}}}{\sum_{p=C,S,P} \frac{\partial Pr(v_{il}^{*}=1)}{\partial X_{il}^{p}}} = \frac{\beta^{p}}{\sum_{p=C,S,P} \beta^{p}} \tag{6}$$

for $p = C, S, P$. Thus, the higher β^{p}, the higher the effect that X_{il}^{p} has in the behavior of the MP. In other words, $\beta_{p} / \sum_{p=C,S,P} \beta^{p}$ measures the relative importance of principal p among the three principals that influence the behavior of the MP.

This model translates very well into an empirical specification. In our data the preferences of all principals and the voting decisions of MPs are all observable and measured in the same units and with respect to the same legislative proposals. Preferences are expressed as being either pro or against a specific legislative proposal l. In our main empirical specification, we define X_{il}^{C} (X_{il}^{S}, X_{il}^{P}) as a binary variable that adopts the value 1 if a majority of the voters (interest groups, party members) is in favor of the proposal and 0 if it is against the proposal. We also

Examples

Example 1. Suppose that X_{il}^{I} has a uniform distribution, i.e., $F(X_{il}^{I}) = X_{il}^{I}$ for $X_{il}^{I} \in [0,1]$. This would be the Laplacian assumption about MPs' ideological preferences. Then, (4) and (5) imply:

$$Pr(v_{il}^{*} = 1) = \begin{cases} 1 & if\ \beta X_{il} \geq \frac{1}{2} \\ \frac{\frac{1}{2} - \beta \mathbf{1} + \beta X_{il}}{1 - \beta \mathbf{1}} & if\ -\frac{1}{2} + \beta \mathbf{1} < \beta X_{il} < \frac{1}{2} \\ 0 & if\ \beta X_{il} \leq -\frac{1}{2} + \beta \mathbf{1} \end{cases}$$

and

$$\frac{\partial Pr(v_{il}^{*}=1)}{\partial X_{il}^{p}}=\begin{cases}0 & if\ \beta X_{il}\geq\frac{1}{2}\\ \frac{\beta^{p}}{1-\beta\mathbf{1}} & if\ -\frac{1}{2}+\beta\mathbf{1}<\beta X_{il}<\frac{1}{2}\\ 0 & if\ \beta X_{il}\leq-\frac{1}{2}+\beta\mathbf{1}\end{cases}$$

for $p=C,S,P$. Thus, $\beta^{p}/\left(1-\sum_{p=C,S,P}\beta^{p}\right)$ is the effect of principal p on the voting behavior of the MP and $\beta^{p}/\sum_{p=C,S,P}\beta^{p}$ is the relative importance of principal p.

Example 2: Suppose that X_{il}^{I} has a truncated logistic distribution, i.e., $F(X_{il}^{I})=\frac{\left[1+e^{-(1-\mu)/s}\right]\left[1-e^{-X_{il}^{I}/s}\right]}{\left[1-e^{-1/s}\right]\left[1+e^{-(X_{il}^{I}-\mu)/s}\right]}$ for $X_{il}^{I}\in[0,1]$ with $\mu\in(0,1)$ and $s>0$. Then, (4) and (5) imply:

$$Pr(v_{il}^{*}=1)=\begin{cases}1 & if\ \beta X_{il}\geq\frac{1}{2}\\ \left(1+e^{\frac{\mu}{s}}\right)\left[e^{\frac{-\frac{1}{2}+\beta X_{il}}{(1-\beta\mathbf{1})s}+\frac{1}{s}}-1\right] & if\ -\frac{1}{2}+\beta\mathbf{1}<\beta X_{il}<\frac{1}{2}\\ \hline \left(e^{\frac{1}{s}}-1\right)\left[1+e^{\frac{-\frac{1}{2}+\beta X_{il}}{(1-\beta\mathbf{1})s}+\frac{\mu}{s}}\right] & \\ 0 & if\ \beta X_{il}\leq-\frac{1}{2}+\beta\mathbf{1}\end{cases}$$

and

$$\frac{\partial Pr(v_{il}^{*}=1)}{\partial X_{il}^{p}}=\begin{cases}0 & if\ \beta X_{il}\geq\frac{1}{2}\\ \left\{\frac{\left(1+e^{\frac{\mu}{s}}\right)\left(1+e^{\frac{1-\mu}{s}}\right)e^{\frac{-\frac{1}{2}+\beta X_{il}}{(1-\beta\mathbf{1})s}+\frac{\mu}{s}}}{\left(e^{\frac{1}{s}}-1\right)\left[1+e^{\frac{-\frac{1}{2}+\beta X_{il}}{(1-\beta\mathbf{1})s}+\frac{\mu}{s}}\right]^{2}}\right\}\frac{\beta^{p}}{(1-\beta\mathbf{1})s} & if\ -\frac{1}{2}+\beta\mathbf{1}<\beta X_{il}<\frac{1}{2}\\ 0 & if\ \beta X_{il}\leq-\frac{1}{2}+\beta\mathbf{1}\end{cases}$$

for $p=C,S,P$. Assume that $\mu=1/2$, i.e., on average MPs do not have any ideological bias in favor or against the proposal and $s=1$. Then, $F(X_{il}^{I})=\frac{\left(1+e^{-1/2}\right)\left[1-e^{-X_{il}^{I}}\right]}{\left(1-e^{-1}\right)\left[1+e^{-\left(X_{il}^{I}-1/2\right)}\right]}$ for $X_{il}^{I}\in[0,1]$, which implies that:

$$Pr(v_{il}^{*}=1)=\begin{cases}1 & if\ \beta X_{il}\geq\frac{1}{2}\\ \dfrac{\left(1+e^{\frac{1}{2}}\right)\left[e^{\frac{-\frac{1}{2}+\beta X_{il}}{(1-\beta\mathbf{1})}+1}-1\right]}{(e-1)\left[1+e^{\frac{-\frac{1}{2}+\beta X_{il}}{1-\beta\mathbf{1}}+\frac{1}{2}}\right]} & if\ -\frac{1}{2}+\beta\mathbf{1}<\beta X_{il}<\frac{1}{2}\\ 0 & if\ \beta X_{il}\leq-\frac{1}{2}+\beta\mathbf{1}\end{cases}$$

and

$$\frac{\partial Pr(v_{il}^{*}=1)}{\partial X_{il}^{p}}=\begin{cases}0 & if\ \beta X_{il}\geq\frac{1}{2}\\ \dfrac{\left(1+e^{\frac{1}{2}}\right)^{2}e^{\frac{-\frac{1}{2}+\beta X_{il}}{(1-\beta\mathbf{1})}+\frac{1}{2}}}{(e-1)\left[1+e^{\frac{-\frac{1}{2}+\beta X_{il}}{(1-\beta\mathbf{1})}+\frac{1}{2}}\right]^{2}}\dfrac{\beta^{p}}{1-\beta\mathbf{1}} & if\ -\frac{1}{2}+\beta\mathbf{1}<\beta X_{il}<\frac{1}{2}\\ 0 & if\ \beta X_{il}\leq-\frac{1}{2}+\beta\mathbf{1}\end{cases}$$

for $p=C,S,P$. Now the marginal effect of principal p on the voting behavior of the MP depends on X_{il}, but it is still the case that the relative importance of principal p is given by $\beta^{p}/\sum_{p=C,S,P}\beta^{p}$.

Endogenous ideology of the MPs

So far, we have assumed that the ideological preferences of the MPs are not related to their principals' preferences. Since MPs have been elected in previous elections, which require the support of voters, interest groups and the party, it would be surprising that the ideological preferences of the MPs are not affected by principals' preferences. For example, more conservative constituencies, interest groups and parties will only support and help electing more conservative MPs. Next, we explore this possibility. In particular, assume that:

$$X_{il}^{I}=\sum\nolimits_{p=C,S,P}\gamma^{p}X_{il}^{p}+\left(1-\sum\nolimits_{p=C,S,P}\gamma^{p}\right)e_{il} \qquad (7)$$

where $\gamma^{p}\in[0,1)$, $\sum_{p=C,S,P}\gamma^{p}<1$ and e_{il} has cumulative distribution function F with support on $[0,1]$, $F(0)=0$ and $F(1)=1$. That is, the ideology of an MP is a weighted average of the

principals' preferences and a pure random shock.[5] Then, the voting decision of MP i regarding legislative proposal l is given by:

$$\tilde{v}_{il}^{*} = \begin{cases} 1 & if\ \tilde{\beta}X_{il} + \left(1 - \tilde{\beta}\mathbf{1}\right)e_{il} > \frac{1}{2} \\ 0 & if\ \tilde{\beta}X_{il} + \left(1 - \tilde{\beta}\mathbf{1}\right)e_{il} \leq \frac{1}{2} \end{cases} \tag{8}$$

where $\tilde{\beta}^{p} = \beta^{p} + (1 - \beta\mathbf{1})\gamma^{p}$ for $p = C, S, P$. The probability that MP i votes in favor of legislative proposal l when the MP's ideology is endogenous is given by:

$$Pr(\tilde{v}_{il}^{*} = 1) = \begin{cases} 1 & if\ \tilde{\beta}X_{il} \geq \frac{1}{2} \\ 1 - F\left(\frac{\frac{1}{2} - \tilde{\beta}X_{il}}{1 - \tilde{\beta}\mathbf{1}}\right) & if\ \frac{1}{2} - \left(1 - \tilde{\beta}\mathbf{1}\right) < \tilde{\beta}X_{il} < \frac{1}{2} \\ 0 & if\ \tilde{\beta}X_{il} \leq -\frac{1}{2} + \beta\mathbf{1} \end{cases} \tag{9}$$

and the marginal effect of X_{il}^{p} on $Pr(\tilde{v}_{il}^{*} = 1)$ is given by:

$$\frac{\partial Pr(\tilde{v}_{il}^{*} = 1)}{\partial X_{il}^{p}} = \begin{cases} 0 & if\ \tilde{\beta}X_{il} \geq \frac{1}{2} \\ F'\left(\frac{\frac{1}{2} - \tilde{\beta}X_{il}}{1 - \tilde{\beta}\mathbf{1}}\right)\frac{\tilde{\beta}^{p}}{1 - \tilde{\beta}\mathbf{1}} & if\ -\frac{1}{2} + \tilde{\beta}\mathbf{1} < \tilde{\beta}X_{il} < \frac{1}{2} \\ 0 & if\ \tilde{\beta}X_{il} \leq -\frac{1}{2} + \tilde{\beta}\mathbf{1} \end{cases} \tag{10}$$

$$\frac{\frac{\partial Pr(\tilde{v}_{il}^{*}=1)}{\partial X_{il}^{p}}}{\sum_{p=C,S,P}\frac{\partial Pr(\tilde{v}_{il}^{*}=1)}{\partial X_{il}^{p}}} = \frac{\tilde{\beta}^{p}}{\sum_{p=C,S,P}\tilde{\beta}^{p}} \tag{11}$$

It is easy to verify that $\tilde{\beta}^{p} / \sum_{p=C,S,P}\tilde{\beta}^{p} = \beta^{p} / \sum_{p=C,S,P}\beta^{p}$ if and only if $\gamma^{p} / \sum_{p=C,S,P}\gamma^{p} = \beta^{p} / \sum_{p=C,S,P}\beta^{p}$. Thus, if the ideological preferences of the MPs do not alter the relative weight of each principal, the relative importance of each principal is the same regardless of whether the ideology of the MP is partially determined by the preferences of the principals or it is a pure random shock. This might be a reasonable benchmark as the same forces that ex-ante affect the selection of MPs with certain ideology will also ex-post influence the reelection of

[5] For example, if $\gamma_C = \delta\beta_C, \gamma_S = \delta\beta_S, \gamma_P = \delta\beta_P$ with $\delta \in (0,1)$, the ideology of the MPs respects the relative weight of each principal.

the MPs. Alternatively, we can think that (5) (i.e., $\beta^p / \sum_{p=C,S,P} \beta^p$) measures the relative importance of principal p when the principals do not have time to select new MPs, while (10) (i.e., $\tilde{\beta}^p / \sum_{p=C,S,P} \tilde{\beta}^p$) measures the relative importance of principal p when principals have time to select new MPs.

IV. MEASURING PRINCIPALS' PREFERENCES

Constituents' Preferences

Since 1848 Switzerland has a bicameral Parliament where the Upper House (Council of States, "Ständerat" in German) is comparable to the United States Senate. Legislative proposals must be approved by majorities of both Houses. The Upper House has 46 members who are elected by a majoritarian rule[6] (two round majority-plurality rule, see Portmann 2014). Since winter 2006 a camera has been recording the sessions of the Upper House, making it possible to identify individual voting behavior of its members (see Stadelmann et al. 2014; Stadelmann et al. 2019 and the appendix therein).

Swiss citizens may challenge Parliamentary decisions in a referendum and Parliamentary decisions do not directly turn into law. Citizens can advance proposals for constitutional amendments through initiatives. Minimum signature requirements are low. Decisions in referenda take place four times per year on a Sunday unless there are elections on the same day. Referenda are mandatory for all constitutional changes (see Portmann 2014; Hessami 2016). Both, voters in referenda and politicians in Parliament decide on identically worded legislative proposals. Thus, decisions of politicians and their constituents are observable and can be directly compared to each other. We obtain a unique and natural measure of representation of a constituency's preferences by matching members of Parliament's roll call votes with referendum results from their electoral districts. Either an MP matches the

[6] In the Canton of Jura and the Canton of Neuchâtel the two members of the Upper House are elected under a proportional system. Omitting them does not affect our results or interpretations. Members of the Lower House are elected under a proportional system and they are not included in the analysis.

majority decision of her constituents or she does not, i.e. the constituent preferences for legislative proposals are observed as a binary variable (see Portmann et al. 2012; Stadelmann et al. 2013; Carey and Hix 2013; Barceló 2019). This direct measure of congruence corresponds to a many-to-one relationship (see Golder and Stramski 2010) as each individual politician is compared with their constituency. The use of a direct measure of congruence relying on referenda and roll call votes has been advocated by Hermann and Leuthold (2007) for Switzerland and suggested by Matsusaka (2010) for the United States.[7] Potrafke (2013) contrasts referendum results with voting behavior of city councils in Germany and Brunner et al. (2013) analyze a large set of matched referendum decisions and votes of politicians for California. Matsusaka (2018) highlights the importance of exploring congruence between voters and politicians by investigating real decisions and confronting them with revealed preferences as we can do in our setting.

At the time of decision in Parliament, MPs must employ standard means such as surveys or their personal experience to predict voters' preferences as it is usual in other democracies without referendum decisions. This is the case because referendum decisions take place after politicians have decided (see Garrett 1999; Stadelmann et al. 2013; Brunner et al. 2013). This is sensible. Direct democracy serves as a check on politicians and as a means to introduce new initiatives into Parliament. In Switzerland, referendum decisions are binding. Referendum decisions present measures of revealed preferences for policies as they permit voters to judge legislative proposals and rank them against the status quo (see, among others, Noam 1980; Schneider et al. 1981; Frey 1994; Bohnet and Frey 1994; Matsusaka 2010). Combining referendum decisions with decisions of MPs is a natural way of evaluating politicians' behavior

[7] Measures of policy responsiveness have been criticized by Matsusaka (2010) which is why we focus on congruence. Since we measure preferences and roll call votes are on the same scale (with even the identical wording), we might also analyze policy responsiveness (see Lax and Phillips 2009) which would, however, change the focus of the analysis.

towards their voters (see Hersch and McDougall 1988; Garrett 1999; Brunner et al. 2013; Giger and Klüver 2016; Barceló 2019; Matsusaka 2017). Brunner et al. (2013) apply the same concept of measuring preferences with referendum decisions to Californian data and advocate that results generalize to other states. Our setting obtains external validity as representatives do not know in advance what their constituency wants but they have to revert to standard means to predict constituents' preferences when voting in Parliament (see Garrett 1999; Brunner et al. 2013). We expect inferences based on this measure for constituent preferences to be reliable and to provide further insights into the workings of democracies and the factors influencing the political representation within a quasi-experimental setting. The direct observation of constituent preferences for specific legislative proposals that politicians vote on in Parliament is the first unique feature of our analytical framework.

Interest Groups' Preferences

The second unique feature of our framework is linked to the way of identifying and measuring preferences of special interest groups. Swiss MPs must disclose all their affiliations with special interest groups such as executive board seats in companies and foundations, committee memberships in public institutions, expert and counselling activities as well as other activities for potential lobbies according to federal law (Art. 11, Parlamentsgesetz). The Swiss Parliamentary Services is required to collect these information and provide it in an easily and publicly available register online (see Gava et al. 2017; Péclat and Puddu 2017). Moreover, the Parliamentary services directly provide information on all special interest groups on the biographic pages for each active MP. Thus, journalists and voters can easily verify whether politicians in their constituency have indicated their special interest group affiliations and there is no incentive to underreport memberships. In fact, we observe that members of Parliament also report comparatively unimportant affiliations such as smaller cultural organization (e.g. Sponsorship of the Opera of Hallwyl Castle) or sports clubs among important organizations

such the Swiss Bankers Association. Thus, we have all personal interest group affiliations of individual members of Parliament.

Next, we need to identify the preferences of interest groups for specific legislative proposals that politicians vote on in Parliament. These will also be the same legislative proposals that constituents decide on in referenda and for which we have constituent preferences. To achieve this, we leverage our institutional setting again. Numerous special interest group organizations frequently give public voting recommendations in Switzerland. Thereby, they reveal their preferences for legislative proposals. Such special interest group organizations include all major business associations (e.g. Economiesuisse), trade unions (e.g. Travail.Suisse), farmers associations (Swiss Farmers' Union), military associations (e.g. Swiss Officers' Society), churches (e.g. Swiss Conference of Bishops) etc. (see e.g. Stadelmann et al. 2015, Stadelmann et al. 2018). Organizations that provide these voting recommendations usually represents umbrella associations for smaller, regional associations, e.g. there are numerous regional unions which join at the national level together as "Travail.Suisse".

Thus, we know the preferences of these umbrella organizations of special interest groups for specific legislative proposals. Evidently, politicians are aware of the preferences of these organizations prior to voting in Parliament. Constituents may be aware of the positions of special interest groups because of their efforts in campaigning for specific legislative proposals. Special interest groups such as companies, employee associations, etc. associate with their respective umbrella organization. Assuming the umbrella organization adequately represents its members, we link the official and public voting recommendation of the umbrella organization to its individual members. Politicians may either affiliate with umbrella organization directly or with their members. Thus, we know what special interest groups that MPs affiliate with want regarding specific legislative proposals, i.e., we observe their revealed preferences for legislative proposals. As politicians usually have more than one special interest group, we average their preferences. In 82.1% of the cases, the average results are either zero

or unity for different legislative proposal, i.e., in general, the preferences of different special interest groups that a politician is affiliated with are binary.

Figure 1 illustrates our way of identifying preferences for special interest groups of politicians using an example. Individual MPs have special interest group affiliations with companies or other organization such as trade unions. These are their personal special interest group affiliations that they report in the public directory following the provisions of the law. The special interest groups are members of larger umbrella organizations, e.g., the Employee Association of the Canton of Zug is a member of Travail.Suisse (the umbrella association for trade unions), similarly the chemical giant F. Hoffmannm-La Roche AG is a member of Economiesuisse. Travail.Suisse and Economiesussie are issuing official voting recommendations on legislative proposals. We link these voting recommendations to their members, i.e. to the Employee association of the Canton of Zug and F. Hoffmann-La Roche AG in our example. Thus, we know what specific personal interest groups of members of Parliament want.

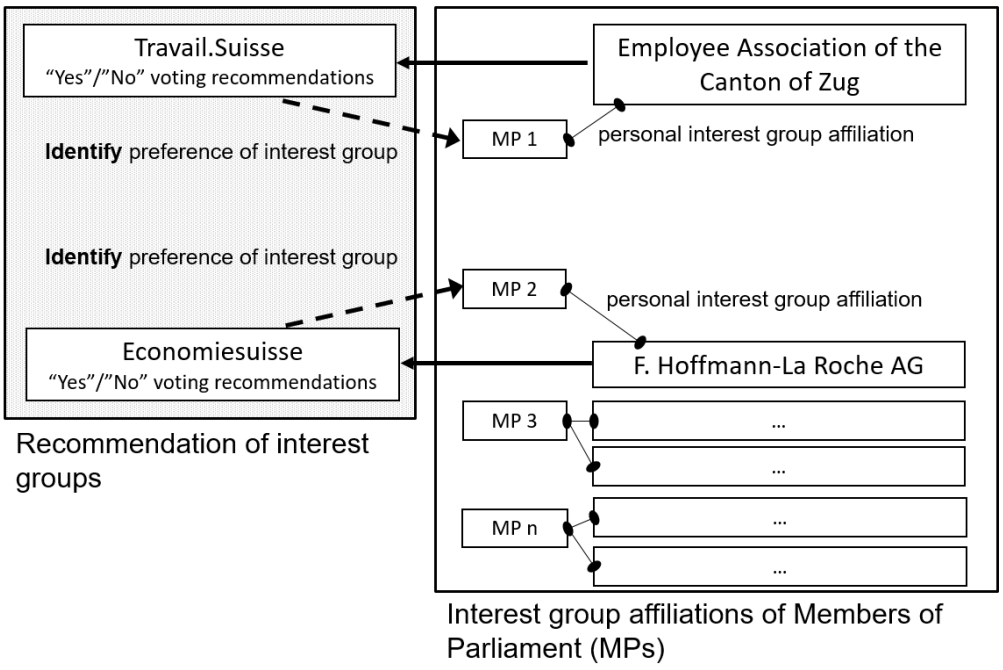

Figure 1: Identifying preferences of interest groups for legislative proposals

Parties' Preferences

Finally, we investigate the relevance of party preferences when MPs decide on legislative proposals. For essentially all referenda, parties offer voting recommendations which are decided upon in party gatherings. The voting recommendation are aimed at the whole national electorate comprised of different constituencies. Such recommendations may reflect existing constituent preferences regarding legislative proposals or try to influence them. Consequently, party recommendations may be positively correlated with constituent preferences. However, parties also compete against each other and offer different voting recommendation such that not only the extent of such a correlation could be doubtful but also whether it is positive or negative. We take these recommendations and analyze whether politicians correspond in their voting behavior to party preferences. Party preferences are officially recorded and communicated in referendum campaigns. They are either in support or against specific policies, i.e., they are binary.

V. DATA AND EMPIRICAL IDENTIFICATION

Data

Our hand-collected dataset consists of 57 legislative proposals with corresponding referendum decisions. Referendum decisions took place between 2008 and 2014 and the respective Parliamentary decisions were carried out during 2007 and 2014. Our dataset starts with the first legislative decision where MPs are registered on camera and which was subject to a referendum and finishes with the last latest full legislature. We include all observations unless a politician has not voted on the legislative proposal or when not all preferences of constituents, interest groups and parties are observed. MPs may abstain from voting in Parliament or they may be absent. While we always observe constituent preferences, interest groups and parties are neutral on a small number of legislative proposals, i.e., in some cases interest groups and parties do not provide any official voting recommendation. Over the different legislative periods we observe a total of 80 distinct politicians from the Upper House

from 26 different cantons. The total number of observations is 1503 which allows us to perform precise and reliable statistical analyses.

Our dependent variable of interest is the decision of MPs on legislative proposals in Parliament, denoted as $MPvotes\text{Yes}$. This is a binary indicator which takes the value of unity if an MP accepts a proposal (votes "Yes") or zero if an MP rejects the proposal (votes "No"). There are three main independent variables.

1. We investigate the relevance of constituent preferences regarding the identically worded legislative proposal l that an MP i decides on in the Upper House of Parliament. The MP is elected by constituents; thus he/she is supposed to represent them. The variable X_{il}^{C} takes the value of unity if a majority of the constituents accepts a legislative proposal, and zero otherwise. The variable has a mean of 0.413 over the whole sample of observations.

2. Special interest group preferences measure whether the majority of the interest groups of MP i is in favor of legislative proposal l. X_{il}^{S} adopts the value of unity if the majority of the special interest groups associated with MP i favors a legislative proposal, and zero otherwise. The variable has a mean of 0.509 over the whole sample of observations.

3. Finally, we measure party preferences with their official voting recommendations issued for referenda. An MP i is affiliated with a certain party and the party either favors or is against a certain legislative proposal l. X_{il}^{P} adopts the value of unity if the party favors legislative proposal l, and zero otherwise. The variable has a mean of 0.483 over the whole sample of observations.

Sources of information, descriptive statistics as well as information on all additional variables are presented in the Appendix (Table A1).

Empirical Model

Due to the clarity of our institutional setting, the empirical model is straightforward. We estimate a logit model explaining the dependent variable $MPvotes\text{Yes}$ with the preferences of principals of the MP. Formally,

$$P((MP\ votes\ \text{Yes} = 1)_{il}) = \Lambda\left(\beta^C X_{il}^C + \beta^S X_{il}^S + \beta^P X_{il}^P + \xi_l\right), \quad (3)$$

where Λ denotes the logistic function (i.e., $\Lambda(x) = \frac{\exp(x)}{1+\exp(x)}$), β^C captures the weight of constituent preferences, β^S the weight of special interest groups preferences, and β^P the weight of party preferences. The preferences of all principals are measured for the same legislative proposal and on the same scale. They are all binary variables taking the value zero if the respective principal rejects the legislative proposal l, and unity if the principal supports the proposal. ξ_l represent referendum-type fixed effects.[8]

VI. MAIN RESULTS

Alignment vs. Conflict Between Preferences

Tables 1 and 2 show that there is alignment and conflict between revealed preferences of constituents, special interest groups and parties. Table 1 presents Pearson correlation coefficients based on legislative decisions of all MPs. There is a positive correlation between the preferences of all principals. The correlation between constituent preferences and special interest groups preferences is 0.455, constituent preferences correlate slightly more with party preferences (0.571) and party preferences reflect to some extent interest group preferences (0.450). Thus, interest groups and parties often align with the preferences of constituents, but the correlation is significantly different from unity. Conflict occurs between principals but there is no systematic misalignment.

[8] We could include district or party fixed effects too. However, they do not provide any explanatory power because the dependent variable is a yes or no vote on a legislative proposal. Referendum type fixed effects are informative and yield explanatory power because mandatory referendums on constitutional changes tend to be more often accepted than simple law changes and citizen initiatives.

	Constituent preferences	Interest group preferences	Party preferences
Constituent preferences	1		
Interest group preferences	0.455	1	
Party preferences	0.571	0.450	1

Notes: Pearson correlation coefficients are presented based on 1503 observations.

Table 1: Correlations of preferences between principals

Table 2 presents conditional probabilities that constituents, special interest groups and parties accept a legislative proposal. Alignment and conflict between the preferences of the different principals can be well observed. If constituent preferences for a legislative proposal are to vote "No", the probability that special interest groups support the proposal is 35.5% and the probability that parties support it is 31.7%. Thus, in 30-35% of the cases special interest groups and parties support legislative proposals that constituents reject. On the other hand, if constituent preferences for a legislative proposal are to vote "Yes", the probability that special interest groups support the proposal is 72.8% and the probability that parties support it is 71.8%, i.e., the probability of supporting a proposal increases by between 35-40 percentage points for interest groups and parties given that constituent preferences are "Yes". If interest groups reject a proposal, the probability that constituents support it is 22.9% and the probability that parties support it is 19.9%. If special interest groups support a proposal, the probability to support it increases to 59.1% for constituents and to 75.7% for parties. Finally, if party preferences are to vote "No", the probability that constituents accept a proposal is 22.5% and it is 23.9% for special interest groups. Conversely, if parties accept a legislative proposal, the probability that constituent preferences in support of it is 38.9 percentage point higher and the support of special interest groups increases to 79.8%. While preferences between different principals are correlated there is relevant conflict and disagreement in numerous cases.

		Conditional probability that …		
		… constituent preferences = "Yes"	… interest group preferences = "Yes"	… party preferences = "Yes"
Given that …	… constituent preferences = "No"	0	0.355	0.317
	… constituent preferences = "Yes"	1	0.728	0.718
	… interest group preferences = "No"	0.229	0	0.199
	… interest group preferences = "Yes"	0.591	1	0.757
	… party preferences = "No"	0.225	0.239	0
	… party preferences = "Yes"	0.614	0.798	1

Notes: The conditional probability that different principals accept a legislative proposal is presented.

Table 2: Conditional probabilities that principals support a legislative proposal.

All Principals Matter

We now investigate the weight that MPs assign to principals' preferences in legislative decisions. Table 3 presents logistic regression estimates of the empirical model (2). We begin by exploring the effect of the preferences of each principal separately (columns 1-3) and then investigate the effect of the preferences of all principals jointly (column 4). For all estimations referendum fixed effects are included and standard errors are clustered at the MP level.

The specification in column (1) shows a positive and statistically significant coefficient for the variable *Constituent preferences = Yes* (C_{il}). Translating the coefficient into a probability estimate reveals that if constituent preferences change from voting "No" to "Yes", then the probability that an MP votes "Yes" increases by 12.3 percentage points, i.e., an MP puts a weight of 12.3% on his/her constituents. Thus, MPs take the preferences of their constituents into account to some extent when deciding on legislative proposals in the Upper House of Parliament.

	(1)	(2)	(3)	(4)
Dependent variable	*MP votes "Yes"*			
Sample	Full sample			
Constituent preferences = "Yes"	0.8241***			0.5551***
	(0.1706)			(0.1941)
Interest group preferences = "Yes"		1.5993***		0.9031***
		(0.2564)		(0.2508)
Party preferences "Yes"			3.9956***	3.7995***
			(0.2701)	(0.2756)
Referendum type FE	Yes	Yes	Yes	Yes
n. Obs.	1503	1503	1503	1503
Pseudo R2	0.5298	0.5692	0.7774	0.7867
Brier	0.138	0.1288	0.0731	0.0703
	Discrete change in probability that MP votes "Yes"			
Discrete change of constituent preferences from "No" to "Yes"	0.1227***			0.0996***
	(0.0298)			(0.0359)
Discrete change of interest group preferences from "No" to "Yes"		0.2867***		0.1758***
		(0.0589)		(0.0497)
Discrete change of party preferences from "No" to "Yes"			0.6161***	0.7236***
			(0.0558)	(0.0404)

Notes: ***, **, and * indicate a mean significance level of <1%, 1-5%, and 5-10%, respectively. Logit models are estimated and robust clustered standard error estimates are reported. Discrete changes are calculated from logit models with the Delta method. When calculating discrete changes, the preferences of the respective other principals are held at zero in specification (4).

Table 3: The impact of preferences of principals on decisions of individual MPs

The specification in column (2) shows that if special interest groups preferences change from rejecting a legislative proposal to accepting it, the probability that an MP votes “Yes” increases by 28.7 percentage points, i.e., the weight that MPs put on special interest groups is 28.7% when no other principals are taken into account. The size of the weight for special interest groups is more than twice that of constituent preferences in the specification in column (1) and it is statistically significant.

The specification in column (3) shows that if party preferences regarding a legislative proposal change from rejecting a legislative proposal to accepting it, the probability that an MP accepts the proposal increases by 61.6 percentage points, i.e., the weight that MPs put on party preferences is 61.6%. Moreover, the coefficient is statistically significant.

Preferences of constituents, special interest groups, and parties are positively correlated. Furthermore, all the principals may influence the voting behavior an MP simultaneously. Thus, investigating each of the principals independently may entail a

considerable bias. For example, if MPs mainly care about their party, the positive effects of constituents and special interest group preferences in specifications (1) and (2) may suffer from an omitted variable bias as both variables are correlated with party preferences (see Table 1). To systematically estimate the weights of different principals, the specification in column (4) includes the revealed preferences for legislative proposals of all principals. The results show that all principals matter, i.e., the coefficient for constituent preferences, special interest group preferences and party preferences are individually positive and statistically significant. If constituent preferences change from voting "No" to "Yes" the probability that an MP votes "Yes" increases by 10.0 percentage points. Similarly, if special interest group preferences change from voting "No" to "Yes" the probability that an MP votes "Yes" increases by 17.6 percentage points. The magnitude of the weight that MPs assign to constituent preferences and interest group preferences decreases in comparison to the specifications in columns (1) and (2). By contrast, the weight that MPs assign to party preferences increases further to 72.4%. Party preferences thus clearly outweigh constituent preferences and even special interest group preferences.

It is interesting to note that the personal ideology or personal motivations of the MPs play virtually no role when deciding on legislative proposals. Adding up the estimated weights that MPs assign to their principals yields 99%, suggesting that personal ideology is quasi-irrelevant.[9] Consequently, personal characteristics (such as competence, charisma, etc.) play, on average, no relevant role once the preferences of all principals are accounted for. We highlight the high explanatory power of the estimation model. In fact, the small Brier score suggests that we are accurately predicting about 75% of the MPs' decisions.

[9] We note that this irrelevance of personal ideology (beyond party ideology) also has to do with the non-linear baseline model (logit) where the weights are determined holding the other principals at zero. Employing a linear probability model instead, suggests that personal ideology may play a minor role.

Alignment and Conflict Affect the Weight of Principals

Our results suggest that politicians put a relatively small weight on the preferences of constituents when making legislative decisions. Special interest group preferences and, particularly, party preferences receive a higher weight for the MPs' decisions. While the concept of political representation is multi-faceted (see Pitkin 1967), one central task of politicians in a democracy is to represent the interests of their constituents. Thus, it is interesting to further explore the weight assigned to voters. To do so, we study how conflict between principals affects the weight that MPs put on voters' preferences.

Probability that MP votes "Yes"

	Interest group preferences = "Yes"		Interest group preferences = "No"	
	Party preferences = "Yes"	Party preferences = "No"	Party preferences = "Yes"	Party preferences = "No"
Constituent preferences = "Yes"	**0.972** [n = 398; 26.5% of sample]	0.611 [n = 54; 3.6% of sample]	0.896 [n = 48; 3.2% of sample]	0.074 [n = 121; 8.1% of sample]
Constituent preferences = "No"	0.912 [n = 181; 12.0% of sample]	0.220 [n = 132; 8.8% of sample]	0.747 [n = 99; 6.6% of sample]	**0.053** [n = 470; 31.3% of sample]

Notes: Probability that MP votes "Yes" on a legislative proposal is presented depending on preferences of principals. Alignment of all principals (constituents, interest groups, parties) marked in bold.

Table 4: The probability that an MP votes "YES" depending on principals' alignment

Table 4 shows the probability that MPs vote "Yes" depending on conflict or alignment between principals. We observe that if constituents, special interest groups and parties (all principals) support a legislative proposal, then the probability that an MP votes "Yes" is 97.2%, i.e., almost unity and we only wrongly predict eight decisions. Similarly, if all principals align in rejecting the legislative proposal, the probability that an MP accepts it is 5.3%. Full alignment of all principals occurs in over 55% of decisions in our sample. When there is conflict between principals, it comes mostly at the expense of constituent preferences. If constituents would want to accept a proposal but parties and special interest groups want to reject it, then it is almost certain that MPs will reject the legislative proposal. The probability that an MP accepts such a proposal is just 7.4%, i.e., only marginally higher that the case where

all principals are against the proposal. Similarly, we observe that if constituents reject a proposal, but special interest groups and parties accept it, the probability that MPs accept it is 91.2%. Thus, constituent preferences tend to be neglected in comparison to the preferences of special interest groups and parties, particularly if an MPs interest groups and party preferences are aligned, but in conflict with constituent preferences.

In table 5 we investigate situations of full alignment and conflict between principals in an econometric setting. The specification in column (1) analyzes a subsample of decisions where one of the three principals is not in alignment with the other two, i.e., where there is some conflict between principals. We observe that, in this situation, all principals matter and the quantitative effects of each principal are similar to those in table 3, column (4). The specification in column (2) of table 5 analyzes a subsample of decisions where there is full alignment between principals. In this setting, we observe that a change in preferences from voting "No" to voting "Yes" increases the probability that an MP votes yes by 76.3 percentage points. In this situation the Pseudo R^2 is particularly high and the Brier score is small such that we correctly predict over 80% of legislative decisions.

	(1)	(2)	(3)
Dependent variable		*MP votes "Yes"*	
Sample	No alignment among principals	Alignment among principals	Full sample
Constituent preferences	0.6372**		0.5180
	(0.2843)		(0.3709)
Interest group preferences	0.8816**		1.1966***
	(0.3609)		(0.3054)
Party preferences	3.9152***		4.2422***
	(0.3435)		(0.3789)
All principals agree in their preferences		4.9702***	
		(0.4678)	
Constituent preferences * Interest group preferences			0.2066
			(0.3860)
Party preferences * Interest group preferences			-0.8509*
			(0.4369)
Constituent preferences * Party preferences			-0.1324
			(0.4035)
Referendum type FE	Yes	Yes	Yes
n. Obs.	635	868	1503
Pseudo R2	0.6333	0.8766	0.7887
Brier	0.1137	0.0377	0.0695
	Discrete change in probability that MP votes "Yes"		
Discrete change of constituent preferences from "No" to "Yes"	0.1139**		0.0845
	(0.0450)		(0.0635)
Discrete change of interest group preferences from "No" to "Yes"	0.1672***		0.2311***
	(0.0589)		(0.0621)
Discrete change of party preferences from "No" to "Yes"	0.7360***		0.7666***
	(0.0554)		(0.0421)
Discrete change of all principals' preferences from "No" to "Yes"		0.7634***	
		(0.0841)	

Notes: ***, **, and * indicate a mean significance level of <1%, 1-5%, and 5-10%, respectively. Logit models are estimated and robust clustered standard error estimates are reported. Discrete changes are calculated from logit models with the Delta method. When calculating discrete changes, the preferences of the respective other principals are held at zero in specification (1) and (3).

Table 5: The impact of preferences of principals depending on their alignment on decisions of individual MPs

Analyzing the full sample of observations and interacting the preferences of the principals among each other to evaluate the relevance of conflict among them confirms the comparatively low weight that MPs assign to their constituents. If constituent preferences chance from “No” to “Yes” for a legislative proposal that is rejected by special interest groups and parties, the weight that MPs assign to constituent preferences is not statistically significant anymore.[10] Conversely, interest group preferences and party preferences always matter for

[10] This setting is different to specification (1) as at most one of the other principals may still align with constituents.

politicians even if they are in conflict among each other or with constituent preferences. Overall, the weights that MPs assign is the highest for parties, followed by special interest groups and it is the lowest for constituents.

On the interpretation of main results

Our setting allows us to measure preferences of constituents, interest groups and parties for specific legislative proposals in a unique way. It enables us to investigate the weights politicians put on different principals directly, which has never been achieved in the literature in such a precise manner. Nevertheless, we would like to critically discuss our approach. Politicians select interest groups and vice versa, politicians affiliate themselves with parties and constituents select politicians in elections. In real-world politics, there is a systematic interaction between all principals and politicians. It is theoretically possible, but practically meaningless to investigate random changes in special interest group preferences or in party preferences. If random changes in policy preferences were to occur, a sensible politician would interact with his/her special interest groups or party and inform himself/herself of why the change has occurred. Subsequently, they would try to convince the principal, that such a random change is not in the principal's own interest. Thus, in real-world politics there is no sensible definition of a "treatment effect". In practice, positions of interest groups or parties do not change randomly. Thus, as our goal is to evaluate the power of constituents versus special interest groups versus parties on actual political decisions, we are forced to investigate realistic situations with observable data. Our setting allows us to determine the weight politicians in competitive situations put on the preferences of their constituents, their interest groups, and parties.

Our results should not be interpreted as evidence of what would happen if constituents, interest groups or parties *randomly* changed their preferences. Instead, our results should be interpreted as an indicator of the weights that politicians put on the respective principals and of what happens in the case of conflict among principals. Such an interpretation is consistent

with the data and of utmost importance to understanding real politics. Moreover, it accurately predicts how legislative proposals are decided on when politicians interact with their principals.

VII. ADDITIONAL RESULTS

This section considers several additional results. First, it explores the presence of heterogenous effects. Second, it presents our estimations for alternative definitions of $\left(X_{il}^{C}, X_{il}^{S}, X_{il}^{P}\right)$; in particular, when $\left(X_{il}^{C}, X_{il}^{S}, X_{il}^{P}\right)$ are defined as continuous variables. Finally, we estimate the model in section III by maximum likelihood.

Heterogeneous Effects

In Table 6 we investigate heterogeneous effects regarding the impact of constituent preferences, interest group preferences and party preferences. That is, we explore whether different groups of politicians assign different weights to their principals.

We split the sample into decisions where there is conflict among the principals (columns 1-6) and decisions where there is full alignment (columns 7-12). We investigate potential differences regarding the weights that female vs. male, elderly vs. young and MPs with more "sectional" than "cause" interest groups put on the preferences of the respective principals. We report changes in the probability that an MP votes "Yes" for a change in the preferences of his/her principals, i.e., we directly report discrete changes. There is some relevant heterogeneity in the weights that politicians with different characteristics put on constituent preferences, special interest group preferences and party preferences.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Discrete change in probability that MP votes "Yes"											
Sample	No alignment among principals and …						Alignment among principals					
	… Female	… Male	… Elderly	… Young	… Sectional > Cause	… Sectional ≤ Cause	… Female	… Male	… Elderly	… Young	… Sectional > Cause	… Sectional ≤ Cause
Discrete change of constituent preferences from "No" to "Yes"	0.1814	0.1249***	0.0698	0.1176**	0.1419***	0.0727						
	(0.1925)	(0.0439)	(0.0896)	(0.0519)	(0.0539)	(0.0816)						
Discrete change of interest group preferences from "No" to "Yes"	-0.0257	0.2158***	0.1913**	0.1834***	0.2759***	0.0693						
	(0.1347)	(0.0612)	(0.0907)	(0.0697)	(0.0722)	(0.0828)						
Discrete change of party preferences from "No" to "Yes"	0.7687***	0.7437***	0.6843***	0.8063***	0.7226***	0.7421***						
	(0.1363)	(0.0509)	(0.1051)	(0.0351)	(0.0519)	(0.0909)						
Discrete change of all principals' preferences from "No" to "Yes"							0.8909***	0.6966***	0.6561***	0.8279***	0.8568***	0.7448***
							(0.0454)	(0.1068)	(0.1330)	(0.0841)	(0.0894)	(0.1226)
n. Obs.	110	525	313	322	286	349	151	717	387	481	435	433
Pseudo R2	0.708	0.6241	0.6583	0.6374	0.5933	0.6796	0.8509	0.8851	0.891	0.8699	0.8867	0.8682
Brier	0.0986	0.1146	0.1139	0.1068	0.1239	0.1006	0.0466	0.0358	0.0338	0.04	0.0333	0.0415

Notes: ***, **, and * indicate a mean significance level of <1%, 1-5%, and 5-10%, respectively. Logit models with robust clustered standard error are estimated employing all principals and referendum type fixed effects. Discrete changes in the probability that an MP votes "Yes" are derived from logit models and reported. Discrete changes are calculated with the Delta method. When calculating discrete changes, the preferences of the respective other principals are held at zero in all specifications.

Table 6: Heterogeneity of the effects of principals according to gender, age and type of interest group depending on their alignment

Comparing female and male politicians, we observe that in the case of conflict between principals in the specifications in columns (1) and (2), only party preferences systematically matter for female MPs. The effects of constituent preferences and interest group preferences are statistically insignificant at conventional levels of statistical significance.[11] Interest group preferences do not obtain any positive weight from female MPs in the case of conflict among principals. If all principals agree, the probability that female MPs vote "Yes" increases by 89.1 percentage points as shown in the specification in column (7).

In contrast to women, all principals matter for men even in situations of conflict. Party preferences have the highest impact for their decisions, followed by interest groups and their constituents. If the preferences of all principals are aligned, the effect of a change in their preferences from voting "No" to voting "Yes" increases the probability that male MPs vote "Yes" by 69.7 percentage points.

Next, we look at older (above median age in the sample) and younger politicians (below or equal to median age in the sample) in the specifications in columns (3), (4), (9) and (10). Investigating differences between elderly and younger MPs show that in the case of conflict among principals, younger MPs put more weight on constituent preferences than elderly MPs. Older MPs put a comparatively lower weight on constituent preferences and on parties. If the preferences of all principals are aligned, the weight that younger MPs put on their preferences is higher than for older politicians. This suggests that older MPs enjoy more leeway in their legislative decisions and can follow their own ideology or personal motivation to a greater extent than younger politicians.

Finally, we investigate differences regarding special interest groups that politicians affiliate with. Following the literature, we distinguish two types of special interest groups (see

[11] The impact of constituent preferences on female politicians is positive and corresponds to 18.1 percentage points when there is conflict among principals. A comparatively small number of observations explain the missing statistical significance of this impact.

Stewart 1958; Klüver 2012, Giger and Klüver 2016; Barceló 2019): sectional and cause groups. Sectional groups represent a section of society such as farmers or business corporations. As such, they rather represent special economic interests. By contrast, cause-groups represent some general belief or principle, such as the environment or public health. The results show that in the case of conflict, MPs with more sectional than cause interest groups take into account constituents, interest groups and parties for their legislative decisions while MPs who are affiliated with cause groups rather than sectional interest groups only consider party preferences (see the specifications in columns 5 and 6). If all principals align, MPs with more sectional interest groups put a higher weight on all principals than MPs with more cause-interest groups (see the specifications in columns 11 and 12). This is in line with the view that politicians with more sectional interest groups are more opportunistic while politicians with more cause interest groups are ideologically oriented, i.e., they react less to other principals apart from their party.

Alternative definitions of $\left(X_{il}^{C}, X_{il}^{S}, X_{il}^{P}\right)$

Work in progress.

Maximum likelihood estimation

Work in progress.

VIII. CONCLUSIONS

Politicians are the common agents of multiple principals, the most fundamental of which are constituents, special interest groups and parties. In some cases, these different principals have aligned preferences, but in others, preferences may differ. We have investigated the weights that politicians assign to the preferences of their constituents, interest groups and party when deciding on legislative proposals. In our setting, these preferences are directly observable. Moreover, we have exploited the fact that the members of the Swiss Parliament vote on identically worded proposals as their constituents in referenda. Constituents thereby reveal their preferences for different legislative proposals. Special interest groups issue official voting recommendations, thereby revealing their preferences. Finally, parties also issue voting

recommendations which reveals their preferences, too. There is no other setting in the world where preferences of constituents, special interest groups and parties can all be matched directly to actual decisions by politicians. Additionally, we have studied real legislative proposals which, if accepted, turn into law.

Our descriptive statistics already show a rich and diversified picture of how common agency works. There is a positive correlation between the preferences of all principals. We have also found that constituent preferences are assigned the lowest weight when politicians make their legislative decisions. Interest group preferences are assigned a higher weight and party preferences have the largest influence. A politician's personal ideology and motivation plays only a minor part for legislative decisions. Taking account of the preferences of constituents, interest groups and parties when politicians make their decisions in Parliament allows us to accurately predict 73.5% of legislative decisions. If there is full alignment between principals, we predict over 95% of all decisions correctly. Finally, our results cast doubt on the empirical relevance of the median voter model and suggest that more principals need to be introduced into the analysis to understand how legislative decisions are made.

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APPENDIX

Variable	Description & Source	Mean	SD	Median	N
MP votes "Yes"	Indicator variable: Member of parliament votes "Yes" on a legislative proposal. Swiss Parliamentary Services Final Votes Dataset.	0.509	0.500	1	1503
Constituent preferences	Indicator variable: Majority of consituents vote "Yes" in referendum. Swiss Parliamentary Services Final Votes Dataset and Année Politique Suisse.	0.413	0.493	0	1503
Interest group preferences	Indicator variable: Majority of interest groups of politicians agree with legislative proposal. Own construction based on Swiss Parliamentary Services Final Votes Dataset.	0.509	0.500	1	1503
Party preferences	Indicator variable: Party suggests to vote "Yes". Own construction based on Swiss Parliamentary Services Final Votes Dataset.	0.483	0.500	0	1503
Alignment	Indicator variable: Constituent, interest group and party preferences are aligned. Own construction.	0.578	0.494	1	1503
Female	Indicator variable: MP is a woman.	0.174	0.379	0	1503
Age	Age of MP in years.	57.2	7.2	58	1503
Referendum type FE	Fixed effects for referendum types (mandatory, facultative, counter-proposal, initiative). Initiative is the omitted category				

Notes: Unweighted descriptive statistics. Data sources indicated next to variable descriptions.

Table A1: Summary statistics