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Abstract

In the aftermath of elections or ballots, the legitimacy of the result is regularly debated if voter turnout was considered to be low. Hence, discussions about legal reforms to increase turnout are common in most democracies. We analyze the impact of a very small change in voting costs on voter turnout. Some municipalities in the Swiss Canton of Berne reduced voting costs by prepaying the postage of the return envelope (CHF 0.85). Prepaid postage is associated with a statistically significant 1.8 percentage point increase in voter turnout. Overall, this amounts to 4 percent more voters participating in the ballots. Moreover, we estimate the influence of this increase in turnout on party support in popular ballots. We find that social democrats and environmentalists see their relative support decline.

JEL-Codes: D720.

Keywords: voting cost, postal voting, voter turnout, party support.

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1. Introduction

The extent to which voters turn out is a recurring theme in the public debate before and after important elections and ballot decisions. For example, the recent presidential elections in the US and France or the close ballot result in the UK to leave the EU, known as Brexit, sparked lively discussions on voter turnout and how it relates to the legitimacy of an election or ballot result. Also the academic literature has focused on voter turnout and its implications for the workings of democracy. Famously, Lijphart (1997) argued that low voter turnout biases electoral influence in favor of the already better-off citizens.

In the last decades countless reforms to increase turnout, for example, by reducing the hurdles to participate in elections have been implemented in western democracies.[1] A very prominent example is the Voting Rights Act of 1965 in the US, which removed hurdles that discriminated against minorities, even though, constitutionally, all citizens had the same fundamental political participation rights (e.g., Alt 1994). Other examples are the introduction of postal voting, as for example in all elections and ballots in Switzerland or (partially) in the US, or (trial) projects to implement online voting systems, as for example in Estonia, the US, or Switzerland (e.g., Solop 2001, Luechinger, Rosinger and Stutzer 2007, Gronke, Galanes-Rosenbaum, Miller and Toffey 2008, Alvarez, Hall and Trechsel 2009, Funk 2010, Gerber, Huber and Hill 2013, Hodler, Luechinger and Stutzer 2015, German and Serdült 2017).

The differences in voting procedures across countries are vast. The US, for example, requires voters' active registration before the actual act of voting. In Switzerland, in contrast, all Swiss citizens of the age of 18 and above automatically receive all the required materials to participate in elections and popular votes. Also the procedures on Election Day differ. While a growing part of the US population has access to postal voting in all-mail, absentee, and early voting procedures (with and without excuse), still a majority of voters in the US cast their vote on a specific day, at a specific location (Gronke, Galanes-Rosenbaum, Miller and Toffey 2008, Giammo and Brox 2010, Gerber, Huber and Hill 2013). In contrast, *all* Swiss voters *automatically* have the option of postal voting. In this case, they fill out their voting materials – which they receive by postal mail at least 3 weeks prior to the ballot – and send it back to the election authority.

[1] Even though most reforms in western democracies aimed to reduce voting cost and increase participation, there are also instances where hurdles have been increased. Recent discussions and law suits in a number of US states, where strict photo identification laws have been introduced in the past years, illustrate this point (for an overview, see National Center of State Legislators (NCSL): http://www.ncsl.org/research/elections-and-campaigns/voter-id.aspx, retrieved: 19.05.2017).

As there are vast differences in voting procedures across democracies, it comes as no surprise that there exists a vast academic literature exploring these differences. It analyzes how people vote and why they vote at all, given the well-known paradox of voting.[2] According to the Downsian model of electoral participation voter turnout decreases with voting costs (Downs 1957, Tullock 1967, Riker and Ordeshook 1968, Aldrich 1993, Feddersen and Sandroni 2006). Voting costs are affected by many factors: information costs, time costs, travel costs, inconveniences such as burdensome voter registration procedures, queuing on ballot day, short or inconvenient opening hours, finding polling stations, social pressure, or the weather, etc. (E.g., Niemi 1976, Feddersen and Pesendorfer 1999, Highton 1997, 2004, Knack 1995, Blais 2000, Haspel and Knotts 2005, Gomez, Hansford and Krause 2007, Gerber, Green and Larimer 2008, Hansford and Gomez 2010, Spencer and Markovits 2010, Brady and McNulty 2011, Fraga 2011, Meier, Schmid and Stutzer 2016, Potrafke and Roesel 2017). A rich literature searches for the institutional drivers of voter turnout, but there is still much debate on which factors have the most consistent impact and are the most important (e.g., Besley and Case 2003, Blais 2006, Geys 2006, Hill 2006, Smets and van Ham 2013, Cancela and Geys 2016). Often, however, studies have to rely on cross-country variation and the exploited institutional differences are not very sharp,[3] or changes in voting cost are not precisely specified.

Our aim is to contribute to this literature and evaluate the impact of a very precise reduction of voting costs on voter turnout, while all else remains constant. We answer two simple yet important questions: Does a small change in the costs of voting affect voter turnout and, if yes, how does it affect party support in popular ballots?

While evidence on the influence of differences in voting procedures – for example, the introduction of postal voting – is not new, we assess the impact of the introduction of prepaid postage, which reduced voting costs by CHF 0.85 today (about USD 0.85), or the price of a stamp. Clearly, this change of voting costs is very precise from the perspective of public authorities. From the perspective of voters, however, prepaid postage might as well have other advantages affecting voting costs for individual citizens. For example, prepaid postage might

[2] For a survey of the theoretical literature, see, e.g., Aldrich (1997), Blais (2000), Mueller (2003), Feddersen (2004), and Hill (2006) and for overviews of the empirical literature, see, e.g., Besley and Case (2003), Blais (2006), Geys (2006) and Cancela and Geys (2016); and Kirchgässner and Schulz (2005) for the case of Switzerland.

[3] For example, electoral systems do not only differ with respect to whether elections are proportional or majoritarian, but also with respect to district magnitude, sequence, and other procedures. Another example is compulsory voting regulation, which comes in different forms, for example, with or without fines for non-voters (e.g., Funk 2007).

also reduce transaction costs, and turnout is possible if stamps are not readily available at home and purchasing stamps at a postal office seems too burdensome. Hence, the costs of the policy are very well specified, while the actual cost reductions of voting might be higher from the perspective of actual voters.

We analyze the impact of prepaid postage on voter turnout in postal voting in Switzerland. In the Canton of Bern, some municipalities distribute prepaid return envelopes for voters who use the option of postal voting, while some municipalities do not prepay the postage. We use this simple and low-cost intervention to analyze the impact of prepaid postage on voter turnout in nationwide ballots. Using a difference-in-differences approach, we find that the introduction of prepaid postage increases turnout by about 1.8 percentage points. Our data also permit us to estimate the impact of (continuous) changes in postage costs – due to increases in stamp prices, the introduction of prepaid postage, and inflation – on voter turnout. Estimating these effects provides a notion of the cost elasticity of voting. We find that a 1 Cent (CHF) increase in postage costs reduces voter turnout by 0.022 to 0.031 percentage points. Furthermore, we study the effect of the increase in voter turnout due to prepaid postage on the relative party support in popular ballots, something we refer to as "voter-party alignment". We compare the municipal voting results in nation-wide ballots with the officially announced voting recommendation of the major parties. Based on these observations we construct a measure of voter-party alignment for each of the five major parties. We find that an increase in turnout negatively affects the alignment of voters with leftist party positions.

Closely related to our research question, Luechinger, Rosinger and Stutzer (2007) find that the introduction of postal voting (per se) in Switzerland increased turnout by about 4.1 percentage points on average. Hodler, Luechinger and Stutzer (2015) document a turnout increase of about 5 percentage points and an altered composition of the active voting population. Postal voting reduced the average years of education as well as the average knowledge of the ballot propositions in the voting population. Bechtel and Schmid (2016) also find an increase in turnout of about 5 percentage points and differential effects on specific groups of voters depending on income, education and genuine interest in politics. Funk (2010) finds that the increase in turnout due to postal voting was modest in the aggregate and that especially small and close-knit communities even saw a negative effect on turnout. She attributes these results

to a reduced incentive to vote, as the social control at the polling station disappeared with the introduction of postal voting.[4]

2. The setup

Today, all Swiss citizens have the option of postal voting. They receive the voting materials with a return envelope. However, the cantons have adopted different rules with respect to whether or not they prepay the postage. In 2003, only the Canton of Geneva provided stamped return envelopes, while the Cantons of Thurgovia and Grisons required municipalities to take over the cost of postage (Federal Chancellery, 2003 and 2010). The Canton of Bern introduced postal voting on July 1, 1991. From the outset, the canton left it to the municipalities to decide whether or not to prepay the postage. Since then, several municipalities have introduced prepaid postage (Table A1 of the Online Appendix).

To increase the participation of young voters, some municipalities introduced "Easyvote". It provides simplified information on all ballot propositions in paper form, which is sent along with the standard voting materials by postal mail before every national ballot. Municipalities can order Easyvote's voting material for their young adults. Easyvote started in 2007 in Interlaken. In Mai 2014, 66 municipalities in the Canton of Bern participated in Easyvote.

We take advantage of the municipal differences with respect to prepaid postage and the later introduction of Easyvote in some municipalities of the Canton of Bern for the period 1989-2014. The Canton of Bern counts 352 municipalities and it is home to about 1 million inhabitants (in 2014) which accounts for about 12.2 percent of the Swiss population. More importantly, voters in different municipalities face the same institutional constraints (political rights in Switzerland are regulated at the cantonal or the federal level) and vote on exactly the same national and cantonal propositions. Direct democracy is an important pillar of the Swiss democratic system. Citizens vote regularly on specific policy issues via referendums at the national, cantonal and local level. We focus on nation-wide ballots, in which the voting decisions across municipalities are identical and hence, make it possible to identify the causal effect of prepaid postage on voter turnout and voter-party alignment in the Canton of Bern.

[4] The estimated coefficients of the introduction of postal voting in Switzerland tend to be higher than comparable estimates in the US (e.g., Gronke, Galanes-Rosenbaum, Miller and Toffey 2008, Giammo and Brox 2010, Gerber, Huber and Hill 2013). For example, Gerber, Huber and Hill (2013) estimate the impact of postal voting in the state of Washington and find an increase of voter participation of about 2 to 4 percentage points. Giammo and Brox (2010) find still positive, but even smaller and, importantly, non-persistent effects of the introduction of early voting and no-excuse absentee voting.

Importantly, postal voting was introduced at the same time in all municipalities. Therefore, previous results on postal voting per se (e.g., Luechinger, Rosinger and Stutzer 2007, Funk 2007, 2010, or Hodler, Luechinger and Stutzer 2015) are not challenged. The adjustments required by voters due to the introduction of prepaid postage by some municipalities is minor in comparison to the introduction of postal voting itself. This homogeneous setup makes us confident of identifying causal effects.

3. The data

Because there is no official information on the municipal practices with respect to whether or not postage is prepaid, we collect the information directly from the 325 municipalities for the period 1989-2014.[5] The reason for the introduction of prepaid postage is not always clear. It seems that budgetary considerations played a role and that beyond these, some municipalities tried to achieve specific goals. Some wanted to compensate for the reduction of the number of polling stations and some to explicitly increase voter turnout. For budgetary reasons some municipalities abrogated the practice of prepaying the postage again after a few years for budgetary reasons.[6]

The Federal Statistical Office provides data on voter turnout and ballot results for all municipalities of the Canton of Bern for all national referenda since 1989. Using information on referenda at the national level has the advantage that the ballots are exactly the same for all municipalities and that the referenda at the national level are unlikely to specifically and systematically target a subsample of municipalities. Turnout is defined as the ratio of the number of votes cast and the number of eligible voters in a municipality. As there are usually multiple ballots on the same day, the turnout of these ballots is very similar. The municipalities of the Canton of Bern only report one measure of turnout for all ballots on the same day. For that reason, the specifications estimating the effect of prepaid postage and Easyvote on turnout count one observation per ballot day. The model specifications estimating the impact of prepaid postage on the voter-party alignment use the information of all ballots per ballot day.

[5] The data contain observations from 325 out of 352 municipalities of the Canton of Berne. We had to exclude municipalities involved in a merger. Out of the 352 municipalities in 2014, 27 mergers affecting 64 municipalities took place since 1991. The merger of municipalities causes some observations to disappear and it remains unclear how to aggregate the data. Therefore, 27 observations are excluded. The municipalities which were involved in a merger and, at the same time, introduced paid postage are Heimenhausen and Langenthal. The mergers took place in 2009 between Heimenhausen, Röthenbach, and Wanzwil, and in 2010 between Langenthal and Untersteckholz.

[6] For an overview see Online Appendix Table A1.

Information on party positions is extracted from the data provided by Année Politique Suisse (2008, 2012) and the Federal Statistical Office. Data on the population, age structure, population density, and share of foreigners are collected from the Federal Statistical Office; municipal income data stem from the Federal Tax Administration. Table 1 presents summary statistics and information on the sources.

[Table 1 about here]

4. The effects of prepaid postage on voter turnout

4.1. Empirical strategy

First, we are interested in identifying the average causal effect of paying postage and introducing Easyvote on voter turnout. We estimate a two-way fixed effects model, which is the panel data application of a difference-in-differences model. We estimate variants of the following basic model:

$$y_{it} = \beta_1 Prepaid\ postage_{it} + \beta_2 Easyvote_{it} + \boldsymbol{X}_{it}\theta + \tau_t + \mu_i + \varepsilon_{it} \qquad (1)$$

where *y* is voter turnout in a municipality *i* on ballot day *t*. *Prepaid postage* and *Easyvote* are dummy variables indicating that postage is prepaid or Easyvote is introduced. $\boldsymbol{X}$ is a vector of controls. τ is a ballot day fixed effect common to all municipalities on vote day *t*, μ is a municipality fixed effect and ε the error term. Standard errors are clustered at the municipal level (Moulton 1986, Bertrand, Duflo and Mullainathan 2004).

Causal estimation in a difference-in-differences framework depends crucially on the common trends assumption. In what follows we provide evidence that there are no significant pre-treatment trends. We also contacted all municipalities that introduced prepaid postage. Four municipalities stated that prepaid postage was introduced to stimulate voter turnout (Table A1 in the Online Appendix). When excluding these municipalities, our findings become somewhat stronger. We know from our communications that other reasons for or against the introduction were the financial situation, the size of the municipality, and the proximity to letter boxes. Therefore, we include covariates in our regressions such as the average municipal income, population size and population density (which might affect the average distance to letter boxes), the ratio of median to mean income as a measure of inequality, the share of foreigners (who cannot participate in the voting process), and the demographic structure.

The pre-treatment characteristics of municipalities that did or did not introduce prepaid postage are not identical. This becomes apparent from the summary statistics reported in Table 1. Large differences are observed for the average population size, population density and mean and median income. It is mostly larger and more urban municipalities which introduce prepaid postage. Note, however, that our estimation strategy does not require equivalence in pre-treatment means: we require parallel trends. Nevertheless, we want to inquire which factors potentially drive the decision to introduce prepaid postage in a regression framework.

[Table 2 about here]

Table 2 presents regression results of prepaid postage on municipal characteristics. In column (1) we display results from pooled OLS regressions, while (2) includes year fixed effects and (3) includes a full set of municipal and year fixed effects. In any event, it is comforting to see that all coefficients are very small and they are all not significantly different from zero. The only exception is median income, which is significant at the 10 percent level in the pooled OLS regression, but not in regressions including fixed effects. The parallel trends assumption will be inquired later on.

4.2. Empirical results

Table 3 presents the results of our difference-in-differences estimates of the influence of the introduction of prepaid postage and Easyvote on voter turnout. Column 1 presents a basic panel regression of voter turnout on the introduction of prepaid postage including municipal and ballot day fixed effect, but excluding other control variables. We find that the introduction increased turnout by 1.822 percentage points and that this effect is statistically significant (columns 1). Including the aforementioned control variables (column 2) reduces the coefficient somewhat to 1.806. Given an average turnout of 42 percent, this translates into an increase of about 4 percent more voters participating in the ballots. Results excluding municipalities that introduced prepaid postage to increase turnout yield similar and even slightly stronger results (column 3). Overall, the effect is sizable and compares to about half the impact of the introduction of postal voting estimated by Luechinger, Rosinger and Stutzer (2007) and about a third of the impact estimated by Hodler, Luechinger and Stutzer (2015).

[Table 3 about here]

Moreover, we find a positive and significant effect of the introduction of Easyvote (column 4). However, this effect becomes insignificant as soon as we include control variables (column 5). In column 6 we jointly include both variables, *Postage* and *Easyvote*. The joint estimation of both treatments does not change the overall results. We also included municipality-specific linear and quadratic time trends (not reported). We find that the results of paying postage remain positive and significant, however, the effect size is somewhat reduced (linear time trends: coef.: 1.399, std. err.: 0.680. quadratic time trend: coef.: 0.871, std. err.: 0.486).

In order to underpin our causal interpretation, Figure 1 presents evidence on potential pre-treatment trends. To investigate potential pre-treatment trends in the difference between the treatment and the control group, we follow Angrist and Pischke (2009) and include lags and leads in our previous regression specification of column 2 of Table 3. Given that the number of municipalities that introduce prepaid postage is not very large and that the introduction is staggered over time, we report two pre- and two post-treatment periods. This representation preserves sufficient statistical power and illustrates the core aspects: the potential of pre-treatment trends and whether or not the post-treatment period is different from the pre-treatment period. The coefficients must be interpreted as the difference in voter turnout between treated and untreated municipalities relative to the baseline period, which is turnout three ballot days or more before the introduction.

[Figure 1 about here]

Figure 1 presents the coefficient estimates and the 95% confidence intervals. We find no statistically significant pre-treatment *effects*, and most importantly, there are no pre-treatment *trends*. We observe a significant increase in turnout in the first post-treatment period and from the second onwards. The post-treatment effects are statistically significant and show a turnout increase of about 2 percentage points.

When extending the number to 10 lags and 5 leads (Figure A1 in the Online Appendix) the qualitative implications are equivalent, but we lack statistical power.[7] In the pre-treatment period the effects oscillate around zero and never reach standard levels of statistical significance. No significant pre-treatment *trends* are observable. In the post-treatment period

[7] We observe a maximum of 6 pre-treatment periods for the group of municipalities that introduced prepaid postage earliest. Given that the representation requires at least on baseline period a maximum of 5 pre-treatment effects can be reported.

the effects generally oscillate around a turnout difference of about 2 percentage points, but the coefficients are only in half of all cases statistically significant. Given that voter turnout is rather volatile (see Figure A2 in the Online Appendix) and that the number of municipalities introducing prepaid postage simultaneously is small, the lack of statistical power with many more lags and leads is not surprising.

If the introduction of prepaid postage had a causal effect on voter turnout, we should – for reasons of symmetry – observe the opposite effect when such a policy is repealed. Six municipalities repealed prepaid postage after some time and we should expect to observe a reduction of turnout after the repeal. When running our standard regression including control variables and municipal and ballot day fixed effects, we find that the repeal of prepaid postage reduces voter turnout by about 0.85 percentage points (coeff.: -0.854, std. err.: 0.499). The estimated coefficient is statistically significant at the 10 percent level and amounts to about half the size of the effect of introducing prepaid postage. Because such an exercise is based on very few observations, the evidence is indicative at best. This (indicative) finding that the repeal of prepaid postage reduces voter turnout further strengthens our interpretation that the estimated effect of the introduction of prepaid postage is causal and not just an artefact of some omitted variable.

Overall, we believe that the evidence in line with parallel trends is strong enough to argue for a causal effect of prepaid postage on voter turnout. The effect seems to persist after the introduction[8] and the evidence indicates that repeals have the opposite effect on turnout.

5. The effect of changes in nominal and real postage costs on voter turnout

So far we have focused on the extensive margin of whether or not a municipality introduced prepaid postage. To strengthen the link between voting cost and voter turnout, it is useful to also study changes at the intensive margin. In a refinement we take advantage of the fact that the costs of postage changed over time in nominal as well as real terms and that these changes differ for municipalities with and without prepaid postage. This allows us to estimate the price elasticity of voter turnout more directly.

[8] This is somewhat in contrast to Giammo and Brox (2010) who do not find persistent effects of early voting and no-excuse absentee voting in the US. However, it seems to be in line with evidence on postal voting in Switzerland.

5.1 Identification strategy

In municipalities *without* prepaid postage, voters are exposed to nominal and real changes of postage costs, while in municipalities with prepaid postage no such price changes are relevant for turnout decisions. While the postage costs to voters are zero in municipalities with prepaid postage, they correspond to the costs of buying a stamp in all others. In the early period of our sample the price of a stamp was CHF 0.50 and, over time, was increased to CHF 0.85 by Swiss Post. Additionally, inflation also affected the real costs of postage. This enables us to exploit various sources of nominal and real price variation in the costs of postage: Costs changes that result from (1) introducing prepaid postage, (2) changes in the price of a stamp (by Swiss Post) and, (3) inflation. The changes through inflation and changes of stamp prices by Swiss Post seem clearly exogenous from the perspective of a municipality of the Canton of Bern. This adds credibility to our identification strategy in that further exogenous variation is used to estimate the impact of voting cost on turnout.

First, we estimate the following two-way fixed effects model:

$$y_{it} = \beta_1 Postage\ costs_{it} + \boldsymbol{X}_{it}\theta + \tau_t + \mu_i + \varepsilon_{it} \quad (2)$$

where *y* is voter turnout in a municipality *i* on ballot day *t*. *Postage costs* is the nominal or real postage costs incurred in postal voting. $\boldsymbol{X}$ is a vector of controls. τ is a ballot day fixed effect common to all municipalities on vote day *t*, μ is a municipality fixed effect and ε the error term.

Secondly, we explicitly investigate two channels through which postage costs are affected: the switch to prepaid postage and decisions by Swiss Post to increase stamp prices. Stamp price changes affect voters in municipalities without prepaid postage. We estimate variants of the following two-way fixed effects 2SLS (FE-2SLS) model:

1st stage: $y_{it} = \beta_1 Prepaid\ postage_{it} + \beta_2 Stamp\ price_{\ it} + \boldsymbol{X}_{it}\theta + \tau_t + \mu_i + \varepsilon_{it}$ (3)

2nd stage: $z_{it} = \beta_2 \hat{y}_{it} + \boldsymbol{X}_{it}\theta + \tau_t + \mu_i + \varepsilon_{it}$ (4)

where *y* is the nominal or real *postage costs* of a municipality *i* for ballot day *t*. *Prepaid postage* is a dummy variable indicating that postage is prepaid and *Stamp price* is a dummy variable for price hikes introduced by Swiss Post. $\boldsymbol{X}$ is a vector of controls. *z* is voter turnout and $\hat{y}$ is the instrumented nominal or real *postage costs* (from the first stage regression) of municipality *i* for ballot *t*. τ is a ballot fixed effect, μ is a municipality fixed effect.

5.2. Empirical results

Column 1 of Table 4 presents two-way fixed effects regressions according to equation (2) of voter turnout on postage costs in nominal (Panel A) and real terms (Panel B). In these regressions we make use all of the variation in the costs of sending back the ballot materials

in postal voting and construct two measures of postage costs: *nominal postage costs* and *real postage costs*. Hence, the variation in these measures stems from price changes introduced by Swiss Post, the introduction of prepaid postage, and inflation in the case of the measure in real terms.

In contrast, Columns 2 to 4 present IV estimates according to equations (3 & 4) in which the variation in postage costs are explained by the introduction of prepaid postage or/and changes in stamp prices by Swiss Post. Hence, the first stage regressions explain changes in nominal and real postage costs by dummy variables of prepaid postage and/or price changes by Swiss Post. The instrumental variables are both significantly correlated with postage costs and Kleibergen-Paap F-Statistics further suggest strong first stages. In the second stage we regress voter turnout on instrumented nominal postage costs (Panel A) and real postage costs (Panel B).

[Table 4 about here]

Overall, the estimated coefficients of postage costs suggest a strong negative and significant effect on voter turnout. The estimates reflect the elasticity of voter turnout: An increase of 1 Cent (CHF) in nominal terms reduces voter turnout by about 0.022 to 0.039 percentage points and an increase of 1 Cent in real terms reduces it by about 0.029 to 0.046 percentage points.

More specifically, column 1 uses the regression framework according to equation (2), in which turnout is directly regressed on postage costs. This regression uses all variation in postage costs, be it price increases by Swiss Post, the introduction of prepaid postage, or inflation in the case of the measure in real terms. The overall elasticity is statistically significant and in both cases (nominal and real) of considerable size: it ranges from -0.022 to -0.029. Hence, an increase of 1 Cent (CHF) reduces voter turnout by 0.022 to 0.029 percentage points.

In Column 2 we focus on nominal and real price variation due only to the introduction of prepaid postage. In IV regressions according to equations (3 & 4) we depend again on our previously established exogeneity assumption of the introduction of prepaid postage. The first

stage regression shows that introducing prepaid postage reduces nominal postage costs on average by almost 73 Cents (CHF) in nominal and 58 Cents (CHF) in real terms. The second stage regression provides the estimated elasticity of voter turnout for this specific instrumental variable. The estimated elasticity is statistically significant and ranges between -0.025 in nominal and -0.031 in real terms. This elasticity (second stage) in combination with the average increase in postage costs due to the introduction of prepaid postage (first stage) produces the total turnout effect of the introduction of prepaid postage: it amounts again to the 1.8 percentage points increase in voter turnout that was reported previously (e.g., in nominal terms: -72.916 x -0.025 = 1.823).

In Column 3 we use variation solely driven by stamp price changes by Swiss Post. Intuitively, we estimate the elasticity of voter turnout by comparing the turnout response due to increases in postage costs (stamp price increases) in municipalities without prepaid postage and compare it to the response in the control group of municipalities with prepaid postage, where stamp prices are irrelevant for the turnout decision. Here the estimated elasticity of voter turnout is with -0.039 (nominal) and -0.046 (real) slightly higher. In Column 4 we use both instruments jointly. The estimated coefficients in the second stage are always negative and statistically significant. Overall, the size of the coefficients is relatively stable, but larger when only stamp price changes by Swiss Post are considered.

These results indicate that increases in voting costs negatively affect voter turnout and that these results do not solely depend on the variation introduced by those municipalities who switch to prepaid postage. The results are further evidence that even small changes in voting costs affect voter turnout in substantial ways.

6. Voter turnout and voter-party alignment

In our last step we want to study whether or not political parties are systematically affected by increases in voter turnout due to the introduction of prepaid postage. In other words, whether or not some segments of the voting population are relatively more responsive to the introduction of prepaid postage.

6.1. Empirical strategy

If, after the results presented so far, we are willing to assume that prepaid postage has a causal effect on voter turnout, we can estimate the impact of the increase in turnout on voter-party

alignment.[9] Voter-party alignment is measured as the share of municipal voters who agreed with the official voting recommendation of a specific party in a nation-wide ballot. For example, the voter-party alignment measure for the liberal party would correspond to the municipal "yes"-share if the liberal party officially recommended accepting the ballot.

We apply a two-way fixed effects 2SLS regression model (FE-2SLS) where prepaid postage is used as an instrument for turnout. This approach is only valid if we believe that the treatment has no direct effect (other than through turnout) on voter-party alignment. Based on the results in the previous sections, we think that this is the case. Moreover, we have no indication that some parties tried to introduce prepaid postage to increase the turnout probability of some specific spectrum of voters. Besides, it seems unlikely that prepaid postage changed fundamental political views, which would constitute another direct channel (for evidence on the stability of voter preferences see Deuchert, Huber and Schelker 2017). Therefore, the most likely interpretation is that prepaid postage affects voter-party alignment through its effect on the turnout probability of some voters (due to the reduction of voting costs), hence increasing turnout and (potentially) changing voter composition. The model we estimate is the following:

$$1^{st} \text{ stage:} \qquad y_{it} = \beta_1 Prepaid\ postage_{it} + \boldsymbol{X}_{it}\theta + \tau_t + \mu_i + \varepsilon_{it} \qquad (5)$$

$$2^{nd} \text{ stage:} \qquad z_{it} = \beta_2 \hat{y}_{it} + \boldsymbol{X}_{it}\theta + \tau_t + \mu_i + \varepsilon_{it} \qquad (6)$$

where y is again voter turnout of a municipality i for ballot t. *Prepaid postage* is a dummy variable indicating that postage is prepaid. $\boldsymbol{X}$ is a vector of controls. z is the voter-party alignment and $\hat{y}$ is the instrumented turnout (from the first stage regression) of municipality i for ballot t. τ is a ballot fixed effect, μ is a municipality fixed effect.

6.2. Empirical results

Table 5 presents the estimation results of a series of FE-2SLS regressions of the impact of turnout (instrumented by the treatment of prepaid postage) on voter-party alignment. Columns 1–7 focus on the effect of an increase of voter turnout (due to the introduction of prepaid postage) on the alignment of voters with the main Swiss parties in nation-wide ballots. From left to right in terms of ideology, these are: SPS (social democrats) and GPS (environmentalists), CVP (Christian democrats), FDP (liberal democrats), and SVP

[9] Given that we did not find any significant effects of Easyvote on turnout, and that the previously used dummy variable on stamp price changes by Swiss Post is not a sufficiently strong instrument in these first stage regressions, we rely solely on the prepaid postage treatment.

(conservatives). We also construct a variable for the alignment with centrist (FDP and CVP) and leftist positions (SPS and GPS), if both respective parties took an explicit position. The differences in the number of observations stem from the fact that not all parties take a position on all ballots.

[Table 5 about here]

We find a significant negative effect of the increase in turnout due to prepaid postage on voter-part alignment with the social democrats (SPS) and the environmentalists (GPS). The size of the effect is such that an increase in voter turnout by one percentage point decreases support by 0.48 percentage points for the positions supported by the social democrats and 0.46 percentage points for the positions supported by the environmentalists. This suggests that the additional voters mobilized by prepaid postage tend to have more conservative positions than the leftist parties. All other estimates are not significantly different from zero.

Other noteworthy results are that municipal income is positively correlated with general support for centrist parties (FDP, CVP) and the environmentalists. The support for the political right (SVP) seems to be stronger in municipalities with lower levels of incomes and higher inequality. Demographic conditions seem to differentially affect the support for positions at the left and the right of the spectrum.

The effect of the increase in turnout on voter-party alignment could also vary as a function of party (dis)agreement. In other words there could be differential mobilization effects depending on whether or not the ideological positions diverge. It could be that lower turnout costs are especially important when the ideological positions of the left and the right are different. Therefore, in Table 6 we look at subsamples of ballots.

[Table 6 about here]

In Column 1 and 2 we present the effect of an increase in turnout due to prepaid postage on the alignment with the right party (SVP) as well as with the centrist parties (CVP & FDP) for the subsample of ballots where the left and the right disagree, independent of the position of the centrist parties. The effect on alignment with the left parties (SPS & GPS) is the mirror image of the effect on the right. In columns 3 and 4 we also take the position of the centrist parties into account. We estimate the effect on voter-party alignment for ballots, where the right party is in opposition to all other parties (centrist and left), and for ballots, where the left parties are in opposition to all other parties. Focusing on these particular subsamples might

provide insights on differential mobilization effects depending on whether or not the ideological positions diverge.

We find that the left opposition tends to differentially increase support for center-right positions, but most estimates do not reach standard levels of statistical significance. The only instance where we find a significant effect is when the conservative party (SVP) opposes all other parties (column 3). The size of the effect is such that an increase in voter turnout by one percentage point increases support by 1.22 percentage points for the position supported only by conservatives (SVP). This hints to the fact that prepaid postage more strongly mobilizes voters on the right (conservatives) when they are in opposition to the rest of the policy spectrum.

To put these results into perspective it is useful to compare them to results in the literature so far. Bechtel, Hangartner and Schmid (2016), for example, find that increases in voter turnout due to compulsory voting laws disproportionally mobilized voters in the lower income segments, which increased the support for leftist parties. Bechtel and Schmid (2016) find that the introduction of postal voting, again, strongly favored leftist and centrist parties. Some of the international evidence also tends to show that increases in voter turnout primarily benefit leftist parties (e.g., Hansford and Gomez 2010, Fowler 2013, Ferwerda 2014, Fujiwara 2015, Ade and Freier 2016, Hoffman, Léon and Lombardi 2017, Potrafke and Roesel 2017). Other, but seemingly fewer studies, document a positive effect in favor of more right wing parties (e.g., Nagel and McNulty 1996, Neiheisel and Burden 2012).

Our results appear to contradict the notion that increases in voter turnout favor leftist governments more generally. To us, it would seem surprising, if every increase in turnout – whatever the instrument to increase it – would benefit the same ideological position. In our reading, the impact of increases in voter turnout will depend on the average turnout already before a policy intervention, and on the specific treatment that might affect the various voter segments differently. The marginal effect of an increase in turnout might depend on whether or not voter participation is already high, and on the size of the provoked change in turnout that is achieved by the intervention. In the setup of Bechtel, Hangartner and Schmid (2016), for example, compulsory voting increased voter turnout by more than 30 percentage points, to an average turnout under compulsory voting of about 83 percent. Clearly, the fines for those abstaining disproportionally affected voters in lower income classes, which potentially are more inclined to favor redistributive, leftist policies. Hodler, Luechinger and Stutzer (2015) show that the introduction of postal voting systematically altered the composition of active

voters in that it reduced the average years of education and knowledge of ballot propositions. However, it also reduced welfare expenditures and business taxes. These effects are not obviously in line with an interpretation that increases in turnout benefit leftist policies in general. Ex ante it seems to remain unclear which voters react to what kind of treatments. Therefore, we interpret our results on the effects of turnout on voter-party alignment as further evidence enriching a yet imprecise picture.

7. Conclusions

We estimate the elasticity of voter turnout and show that a reduction of voting costs of as little as 85 cents per voter can have a substantial influence on voter turnout. We find that the introduction of prepaid postage in postal voting increases voter turnout by about 4 percent. A second intervention is the introduction of Easyvote, which sends out specific and easy-to-understand voting materials to young voters. We do not find a significant impact of this initiative.

Obviously, the introduction of prepaid postage can reduce voting costs for individual citizens by more than the value of the postage. For example, it makes it possible for voters to use postal voting even in the case when stamps are not available in the household and queuing for stamps in the post office seems too burdensome. To further tighten the link with actual voting costs, we refine our analysis and focus on changes in nominal and real postage costs. The introduction of prepaid postage, changes in the pricing of stamps by the Swiss Post as well as inflation affect the monetary costs of postal voting. We find that an increase in postage costs of 1 Cent (CHF) reduces voter turnout by about 0.025 to 0.031 percentage points. Again, the estimated effects are not only statistically significant, but they also seem politically and economically relevant.

Given the robust effect of prepaid postage on voter turnout, we continue to analyze the effect of voter turnout on voter-party alignment. We find that through the increase of voter turnout, prepaid postage tends to reduce support for leftist positions in nation-wide ballots. These findings are evidence that already a very small reduction of voting costs can affect turnout in substantial ways and that the political parties are differentially affected by such changes.

Obviously, reducing voting costs can bring more voters to the ballot. However, it remains unclear, how such changes in the active voter composition affect overall policy outcomes and general welfare. It is possible that such changes affect specific subgroups beyond pure party preferences. It could disproportionally favor socio-economic groups that are already today

relatively over-represented (for example, voters with higher education and socio-economic status) or it might also help to reduce this well-known gap (e.g., Lijphart 1997, Hodler, Lüchinger and Stutzer 2015, Bechtel and Schmid 2016). Further research is needed to understand the specificities of turnout and voting costs.

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TABLES AND FIGURES

Table 1: Summary statistics

	Overall		No paid postage	Paid postage		
Variable	Min Max	Mean Std. dev.	Mean Std. dev.	Mean Std. dev.	Mean diff. (Std. err.)	Source
Prepaid postage	0	0.03	0	1	-	Own documentation
	1	0.16	-	-	-	
Turnout	7.02	41.94	42.11	44.91	2.79	Federal Statistical Office
	100	11.32	9.92	7.69	0.67	
Aligned SVP	0	60.15	60.18	59.23	-0.95	
	100	18.10	18.09	18.46	0.42	
Aligned FDP	0	59.73	59.70	60.83	1.13	
	100	18.35	18.37	17.63	0.43	
Aligned CVP	0	60.24	60.20	61.64	1.43	
	100	18.11	18.14	17.11	0.42	
Aligned SPS	0	48.92	48.88	50.39	1.51	Année Politique Suisse,
	100	20.61	20.61	20.59	0.49	own calculations
Aligned GPS	0	48.17	48.14	49.18	1.04	
	100	20.52	20.52	20.53	0.49	
Aligned center	0	60.91	60.87	62.46	1.59	
	100	17.89	17.92	16.88	0.44	
Aligned left	0	48.40	48.37	49.73	1.36	
	100	20.54	20.54	20.58	0.51	
Mean income	25.39	50.44	51.01	57.66	6.64	Federal Tax Administration
(1000 CHF)	138.88	10.80	11.11	12.58	0.76	
Median income	23.55	42.75	43.20	48.06	4.86	Federal Tax Administration
(1000 CHF)	77.58	7.62	7.90	8.59	0.54	
Median/mean	0.33	0.85	0.85	0.84	-0.01	Federal Tax Administration
income	1.06	0.05	0.05	0.04	0.00	
Population	0.03	2.63	2.46	9.02	6.56	Federal Statistical Office
	138.04	8.52	8.25	13.93	0.58	
Pop. density	0.01	2.65	2.55	6.70	4.15	Federal Statistical Office
(per km2)	49.32	4.70	4.56	7.47	0.32	
% foreigners	0	6.77	6.77	10.32	3.55	Federal Statistical Office
	30.55	4.98	4.97	6.35	0.34	
% young (0-25)	14.63	29.88	29.69	27.76	-1.93	Federal Statistical Office
	54.55	3.72	3.80	3.01	0.26	
% aged (64+)	2.74	17.05	17.19	17.33	0.13	Federal Statistical Office
	34.09	2.93	2.96	3.13	0.20	

Table 2: Potential determinants of Prepaid postage

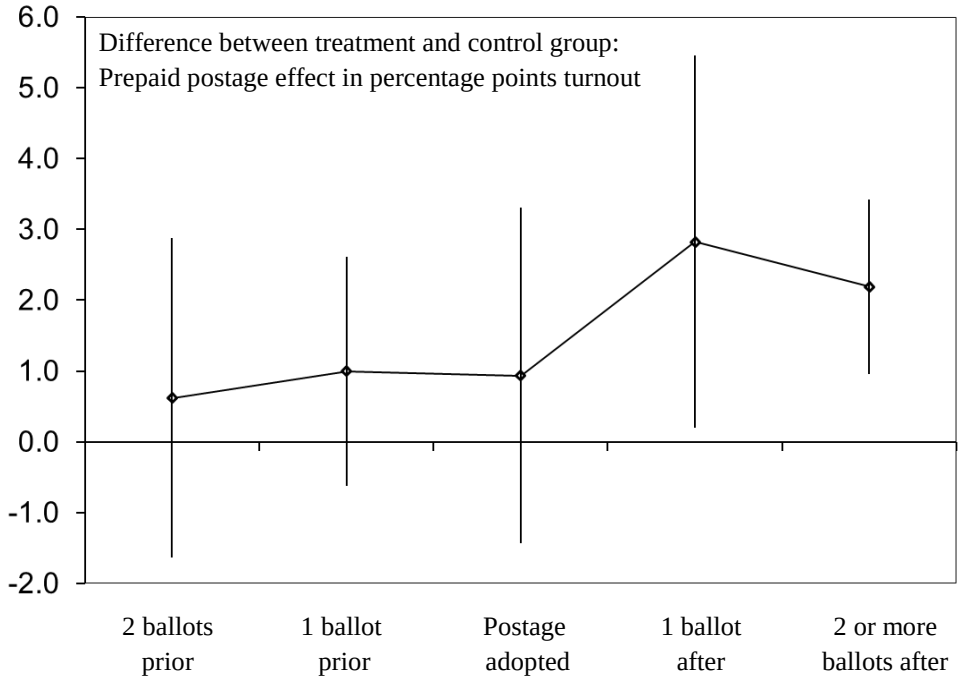
	(1)	(2)	(3)
Dependent variable	Prepaid postage	Prepaid postage	Prepaid postage
Mean income	0.001	0.000	-0.000
(in 1000)	(0.000)	(0.001)	(0.001)
Median/mean	0.103*	0.075	0.053
income	(0.059)	(0.072)	(0.067)
Population	0.002	0.002	0.027
(in 1000)	(0.003)	(0.003)	(0.018)
Population	0.005	0.005	0.026
density	(0.004)	(0.005)	(0.021)
% foreigners	0.003	0.002	0.004
	(0.003)	(0.003)	(0.004)
% young	-0.001	-0.001	-0.002
	(0.002)	(0.002)	(0.002)
% aged	-0.000	-0.000	-0.001
	(0.003)	(0.003)	(0.003)
Municipal FE	no	no	yes
Year FE	no	yes	yes
Observations	8,450	8,450	8,450
R^2	0.027	0.028	0.032
No. municipalities	325	325	325

Table 3: Difference-in-differences estimation of *Turnout* on *Prepaid postage*

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Turnout	Turnout	Turnout	Turnout	Turnout	Turnout
Sample	Full sample	Full sample	Sub-sample	Full sample	Full sample	Full sample
Prepaid postage	1.822***	1.806***	2.090***			1.760***
	(0.408)	(0.462)	(0.541)			(0.468)
Easyvote				0.640*	0.615	0.547
				(0.372)	(0.387)	(0.395)
Mean income		0.112***	0.111***		0.111***	0.112***
(in 1000)		(0.029)	(0.030)		(0.029)	(0.029)
Median/mean		1.850	1.717		1.885	1.819
income		(2.958)	(2.967)		(2.955)	(2.946)
Population		-0.408**	-0.423***		-0.363**	-0.415***
(in 1000)		(0.162)	(0.156)		(0.165)	(0.146)
Population		0.641***	0.634***		0.685***	0.638***
density		(0.223)	(0.223)		(0.224)	(0.220)
% foreigners		0.055	0.054		0.055	0.049
		(0.059)	(0.060)		(0.060)	(0.060)
% young		0.250***	0.254***		0.248***	0.251***
		(0.082)	(0.083)		(0.082)	(0.082)
% aged		0.211**	0.211**		0.210**	0.212**
		(0.085)	(0.086)		(0.085)	(0.085)
Municipal FE	yes	yes	yes	yes	yes	yes
Ballot day FE	yes	yes	yes	yes	yes	yes
Observations	24,375	24,375	24,150	24,375	24,375	24,375
R^2	0.824	0.825	0.825	0.824	0.825	0.826
No. municipalities	325	325	322	325	325	325

Notes: Standard errors are adjusted to clustering at the municipality level and are reported in parentheses. Significance level: *$P < 0.1$, **$P < 0.05$, ***$P < 0.01$.

Figure 1: Analysis of pre-treatment trends



Notes: Testing the common trend assumption: Estimated pre- and post-treatment effects. Estimated coefficients of lags and leads of treatment dummy (Prepaid postage). Vertical bands represent 95% confidence intervals. Two-way fixed effects regression. Observations: 23'879. R^2: 0.824. No municipalities: 325. Control variables included. Baseline specification according to Table 3, column 2. Standard errors are adjusted to clustering at the municipality level.

Table 4: Estimation of *Turnout* on *nominal* and *real postage costs*

	(1)	(2)	(3)	(4)
Instrumental variables:	-	Prepaid postage	Stamp price	Prepaid postage, stamp price
Dependent variable:	Turnout	Turnout	Turnout	Turnout
Panel A		Second stage regression, equation (4)		
Nominal postage costs	-0.022***	-0.025***	-0.039**	-0.025***
	(0.006)	(0.006)	(0.016)	(0.006)
Controls	yes	yes	yes	yes
Muncipal fixed effects	yes	yes	yes	yes
Ballot day fixed effects	yes	yes	yes	yes
		First stage regression, equation (3)		
Postage		-72.916***	-	-72.246***
		(3.264)	-	(3.371)
Stamp price change by Swiss		-	27.205***	8.059***
Post		-	(3.336)	(1.579)
Kleibergen-Paap F-Statistic		498.95	66.51	904.28
Panel B		Second stage regression, equation (4)		
Real postage costs	-0.029***	-0.031***	-0.046**	-0.031***
	(0.007)	(0.008)	(0.019)	(0.008)
Controls	yes	yes	yes	yes
Muncipal fixed effects	yes	yes	yes	yes
Ballot day fixed effects	yes	yes	yes	yes
		First stage regression, equation (3)		
Postage		-58.170***	-	-57.549***
		(1.967)	-	(2.028)
Stamp price change by Swiss		-	22.724***	7.474***
Post		-	(2.732)	(0.916)
Kleibergen-Paap F-Statistic		874.52	69.18	1643.27
Observations	24,375	24,375	24,375	24,375
R-squared	0.825	0.825	0.825	0.825
Number of Municipalities	325	325	325	325

Notes: Fixed effects 2SLS. Standard errors are adjusted to clustering at the municipality level and are reported in parentheses. Instrument: Prepaid postage and/or stamp price change. Significance level: * $0.05 < p < 0.1$, ** $0.01 < p < 0.05$, *** $p < 0.01$.

Table 5: IV estimation of *Voter-Party Alignment* on *Turnout*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Social democrats	Environ-mentalists	Christian democrats	Liberal democrats	Conservati-ves (right)	Aligned Left	Aligned Center
Dependent variable	Aligned SPS	Aligned GPS	Aligned CVP	Aligned FDP	Aligned SVP	SPS & GPS	FDP & CVP
	Second stage regression, equation (6)						
IV: Turnout	-0.489*	-0.461*	-0.078	-0.016	0.020	-0.437	0.016
	(0.281)	(0.240)	(0.292)	(0.317)	(0.658)	(0.277)	(0.338)
Mean income	0.058	0.113**	0.069**	0.073**	-0.178**	0.066	0.085**
(in 1000)	(0.044)	(0.047)	(0.035)	(0.037)	(0.086)	(0.044)	(0.038)
Median/mean	0.510	5.134*	2.666	3.245	-7.542***	1.967	4.092*
income	(2.571)	(2.911)	(2.110)	(2.140)	(2.381)	(2.704)	(2.278)
Population	-0.445**	-0.533***	-0.220	-0.089	0.919	-0.409*	-0.196
(in 1000)	(0.220)	(0.167)	(0.179)	(0.171)	(0.595)	(0.231)	(0.221)
Population	-1.088**	-0.867**	0.365	0.544*	-1.428	-1.246**	0.671*
density	(0.526)	(0.396)	(0.277)	(0.294)	(0.890)	(0.522)	(0.356)
% foreigners	-0.119*	-0.093	-0.016	0.020	-0.169**	-0.113	0.025
	(0.071)	(0.076)	(0.041)	(0.046)	(0.071)	(0.074)	(0.048)
% young	0.438***	0.563***	0.013	-0.079	-0.381**	0.469***	-0.035
	(0.113)	(0.126)	(0.076)	(0.099)	(0.188)	(0.118)	(0.101)
% aged	0.125	0.219**	0.076	0.044	-0.261*	0.140	0.081
	(0.096)	(0.108)	(0.065)	(0.073)	(0.154)	(0.097)	(0.079)
Municipal FE	yes	yes	yes	yes	yes	yes	yes
Ballot day FE	yes	yes	yes	yes	yes	yes	yes
	First stage regression, equation (5)						
Prepaid postage	1.834***	1.839***	1.902***	1.914***	1.914***	1.769***	1.927***
	(0.410)	(0.446)	(0.433)	(0.433)	(0.426)	(0.421)	(0.439)
Observations	69,875	70,200	73,450	73,125	73,775	63,700	65,975
R^2	0.826	0.811	0.756	0.762	0.758	0.827	0.755
K–P statistic†	20.04	16.98	19.33	19.53	20.14	17.62	19.26
No. municipalities	325	325	325	325	325	325	325

Notes: Fixed effects 2SLS. Standard errors are adjusted to clustering at the municipality level and are reported in parentheses. Instrument: Postage. Significance level: * 0.05 < p < 0.1, ** 0.01 < p < 0.05, *** p < 0.01. † Kleibergen-Paap Wald rk F-statistic.

Table 6: Subsamples – IV estimation of *Voter-Party Alignment* on *Turnout*

	(1)	(2)	(3)	(4)
	Disagree: Right-Left	Disagree: Right-Left	Disagree: Right-others	Disagree: Left-others
Dependent variable	Aligned Right	Aligned Centrist	Aligned Right	Aligned Leftist
	Second stage regression on subsamples, equation (6)			
IV: Turnout	0.320	0.246	1.221*	-0.281
	(0.371)	(0.473)	(0.647)	(0.298)
Controls	yes	yes	yes	yes
Municipal FE	yes	yes	yes	yes
Ballot day FE	yes	yes	yes	yes
Observations	49,075	42,575	14,625	27,950
R^2	0.790	0.731	0.644	0.771
K–P statistic†	14.36	13.74	10.18	12.33
No. municipalities	325	325	325	325

Notes: Fixed effects 2SLS. Standard errors are adjusted to clustering at the municipality level and are reported in parentheses. Instrument: Prepaid postage. Significance level: * $0.05 < p < 0.1$, ** $0.01 < p < 0.05$, *** $p < 0.01$. † Kleibergen-Paap Wald rk F-statistic.