

Does Political Competition Matter for Public Goods Provision?: Evidence from Russian Regions¹

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Abstract

In an autocracy, does political competition always improve the provision of public goods? Do different mechanisms for selecting governors affect the amount provided? For 2004-2009, we use panel data for 74 Russian regions to study how the intensity of local political competition affects the amount of public goods that the governors provide. For each region, we measure political competition by the share of seats the national ruling party holds in the regional legislature and by the Herfindahl-Hirschman Index. For regions with substantial competition in their local legislatures, we find that governors appointed by the national government provide more public goods than do governors who are chosen locally. The latter appear to allocate more funds for themselves. But for regions in which one party has a near monopoly of political power, governors chosen by the region provide more public goods than governors appointed by the national government. Moreover, we find evidence of a non-monotonic (inverted U) relationship between the intensity of political competition, the efficiency of accountability mechanisms, and some measures of public goods (primarily education and health care).

Introduction

What institutional mechanisms best motivate politicians to work in favor of society? And do mechanisms of political accountability that work in developed states also promote social welfare in less open societies? Although we have an increasing body of evidence that greater openness and political competition generally results with better incentives for those in office, it does not necessarily follow that increases in political competition are always and everywhere unambiguously beneficial to society, particularly in autocracies.

For instance, Besley and Burgess (2002) show that greater political competition leads to greater calamity expenditures. And Careaga and Weingast (2001) claim that higher levels of political competition result in policies with lower levels of corruption and greater provision of public goods. On the other hand, Acemoglu and Robinson (2006) make clear that the link between political competition and growth promoting policy is non-monotonic; that under certain conditions, moving from a low level to an intermediate level of political competition might lead to growth-inhibiting behavior even if the overall link between openness and good policy is positive.² This is especially true for countries where the political culture is not fully democratic.

Does political competition matter for public policies under conditions of unfair elections and autocracy? Will political competition lead to more socially desirable outcomes or the reverse in such states? Given that most of the world lives under systems that are far from being the “inclusive” (Acemoglu and Robinson, 2012) or “open-access” societies (North, Wallis, and Weingast, 2009) that leading scholars claim best promote human welfare, the relationship between political competition and public welfare emerges as a critical issue for political economy.

While most of the literature has focused on the impact of political competition on growth promoting policies, little attention is paid to the impact of political competition on public goods

² A similar dynamic is argued by North, Wallis, and Weingast (2009).

provision, especially under autocratic regimes. This paper attempts to fill this gap in the literature.

Furthermore there is no unambiguous opinion regarding the question about the outcomes of policies implemented by officials captured by the local elites. Some scholars argue that officials captured by local elites pursue only the goals of the business elites, resulting in waste and corruption (Bardhan, 2002; Sonin, 2010). In contrast, Zhuravskaya and Persson (2011) find that Chinese governors who built their careers within the province they govern and have strong ties with local elite, provide more public goods than those from governors who came from another province. We develop this idea and try to show that impact of officials' career path on the policy they chose non-monotonically depends on the intensity of political competition.

We address this issue using data from Russia which we know has experienced a large transformation of political institutions and changes in the intensity of political competition over the last decade. This experience gives us a chance to assess how different levels of political competition affect the provision of public goods. Also, it allows us to gauge whether formal (administrative subordination and career concerns) or informal (networking) mechanisms of accountability work better with different levels of competition. As we will see, the evidence suggests a non-monotonic relationship between political competition and the effectiveness of accountability mechanisms in encouraging public goods spending.

There are numerous studies of governors and their policies in Russian before 2005. Frye et al. (2011) examine in detail the importance of election versus appointment by the central government in influencing the quality of governors. Their work focuses on the backgrounds of governors who were elected or appointed between 1992 and 2010 to understand variance in selection but even they conclude that selection choice only explains a small part of this. Our paper's contribution is to show the effects of post reform changes in political selection mechanisms on changes in public goods provision by different types of governors in Russia.

Our paper is organized as follows. In Section 2, we describe the historical background that led to the new 2005 system. Section 3 introduces the conceptual framework that motivates the model in Section 4, which contains our estimation results. Our conclusions are presented in Section 5.

2. Background

It has been well documented that in the 1990s Russia had a highly decentralized political system with a weak federal government and strong regional elites, representing mostly local big business³. From 1995-2005 all governors in the Russian Federation were elected by the inhabitants of the region they governed. Governors could be replaced only after the term of their mandates expired. The federal government could neither appoint nor replace regional heads.

Regional legislatures were formed by majoritarian rule. Each region was divided into several electoral districts, inhabitants of which elected their representatives to the regional parliament. At the same time, national political parties were weak with weak party discipline whereas regional legislatures were controlled by local elites, and/or local political parties were created to represent the interests of local big business. Thus, local but not federal elites dominated both in the legislative and in the executive branches of the Russian regions and they exclusively made decisions over budget spending. They also bargained with federal elites over federal transfers.

As soon as Vladimir Putin became President of the Russian Federation, several remarkable changes in the laws concerning elections and political parties were made.

First, in 2001 the law regulating political parties' activities was changed. According to the new law, political parties had to prove that they did have at least 10,000 members. They also needed to have branches in each region of the Russian Federation. Moreover in at least 50% of the regions, parties had to have at least 500 members, and at least 250 proven members in the

³ See Sonin K. (2003), Slinko I., Yakovlev E., Zhuravskaya E. (2005), Zhuravskaya (2010) etc.

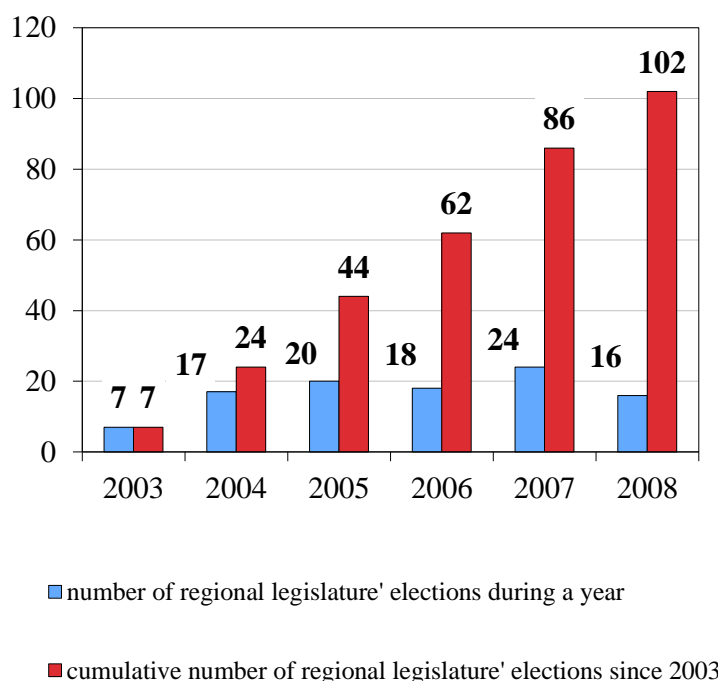
remaining regions. If any of these requirements were violated, the political party could not exist nor participate in any kind of elections. Thus this law has effectively forbidden regional political parties. All political parties had to meet these requirements by the summer of 2003. In 2005 a new law required that political parties had to prove they had no fewer than 50,000 members. These changes in the law resulted in a dramatic decline of the number of political parties. At the end of 2003 there were 44 political parties in Russia, but by the spring of 2009 only 7 survived and 4 among them took part in regional elections in most regions.

Second, the new elections law required that as from July 2003, in elections to the regional legislature, no less than 50% of representatives had to be elected from parties' lists. Thus, in regional elections the majoritarian rule was replaced by a mixed-proportional rule. Some regions went further and in 2007 rejected the mixed-proportional rule in favor of a fully proportional voting system. Taking into account that by 2003-2004 the ruling party "United Russia"⁴ was completely dominant among national parties at the federal level, the requirement of 50% of the representatives coming from political party lists gave the ruling party the chance to get control over regional legislatures⁵. The new rules for regional legislatures began on the 7th of December 2003. The date of the next elections embodying these new rules was made dependent on the date of the previous elections (see Figure 1).

⁴ "United Russia" was created on December 1, 2001 and included 3 political parties namely "Unity" («Единство»), "Fatherland" («Отечество») and "All Russia" («Вся Россия»). "United Russia" won federal elections to State Duma (National Parliament) on December 7, 2003 and got the constitutional majority. It was the first successful attempt to create a ruling party in Russia. The previous attempt to create such a national ruling party in the 90s—the so called "Our home is Russia" («Наш дом Россия») party – failed.

⁵ Since this time Russian electoral statistics contain data concerning the political parties' structure of representatives in regional legislatures.

Figure 1. Number of regional legislatures elected by new voting rules



Third, in October 2004 President V. Putin decided that after 2005, direct election of governors would be replaced by appointments made by the President of the Russian Federation. Since that time, the President could appoint and replace governors as he wished. In order to legitimize decisions about replacement and appointments of governors, criteria for the evaluation of governors' performance was created in 2007 and since then has been dramatically changed several times⁶. However in practice the system was not used for this purpose. When deciding about governors' appointment or replacement, the federal government seemed to show little concern for the social and economic situation in the region, whereas success in both federal and regional elections was the most important factor for reappointment⁷.

Thus, since 2005 there are three types of governors:

- 1) Elected governors whose terms have not yet expired (so-called politicians);
- 2) Appointed governors who were elected before the new system was put in place (so-called old bureaucrats);

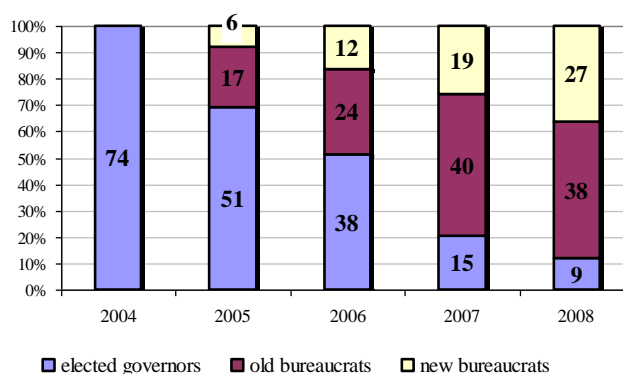
⁶ The first attempt to create such a system was made in 2005 when the criteria included 30 indicators, but this system of evaluation was not based on a law. In 2007 a new system including 77 indicators of regional performance was created and based on federal law. Later on criteria were increased again up to 460 indicators. In 2012 it was discussed that the number of indicators should be reduced to 12.

⁷ See e.g., Turovskii (2009), Golosov (2008) and Sharafutdinova (2010).

3) Appointed governors who had never been elected before (so-called new bureaucrats).

Figure 2 illustrates the structure of governors since 2004.

Figure 2. Structure of Russian governors by type



If we look at the structure of incentives for the different types of governors, we can see that the first two types are very close. Both elected governors and appointed governors who were elected earlier had two principals: local elites (which helped them to be elected before and who might have been bribed to give the appointments) and federal elites (which could appoint or replace a governor at any moment). We will no longer distinguish between old bureaucrats and governors-politicians, because they have similar incentives. Unlike them, governors-new bureaucrats who have never been elected, have only one principal and one contract with the federal elites. They have few connections and own no obligations to the local elite.

It should also be mentioned that by 2005 almost all tax resources were redistributed through the federal budget, while regional governments were in charge of mostly social expenditures. That is why most regional budgets were running a deficit and were badly dependent on transfers from the federal budget⁸.

⁸ Zhuravskaya (2010).

Thus, by 2005 federal elites and the President himself had created a regional political system designed to force local elites to share rents with the federal government as well as to force them to provide desirable results for all kinds of elections, and mainly for federal ones.

3. Conceptual Framework

We use a simple framework to analyze the political conditions which encourage/discourage governors from providing public goods. We adopt a slightly modified version of the theoretical framework first proposed by Persson and Zhuravskaya (2011). This should not be seen as a complete formal model of the process but merely serves as a theoretical illustration of the primary hypotheses to be tested.

Governors can spend public funds in three ways: on public goods (g), appropriation in their own favor (e) and appropriation in favor of the local elite (j).

Spending on public goods g benefits the region as well as its residents (population). The benefit function is given by $y = f(g) + \varepsilon$, where $f(g)$ is an increasing linear function and ε is a random variable describing the uncertainty of the size of the benefit generated by a given level of public spending.

Regional resources *extracted by a governor in his own favor* e , generate no social benefits but yield private benefits $t(e)$ to that politician. We assume that $t(e)$ is an increasing linear function. Similarly, regional resources *extracted by a governor in favor of the local elite* j , generate no social benefits but yield private benefits $b(j)$ to the local elite.

Normalizing total resources to I , the resource constraint is thus $I = g + e + j$.

The general population (residents of a region) cares only about spending on public goods g and their utility is maximized when all resources are spent on public goods $I = g$.

The local elite benefits not only from funds appropriated in their favor by governors, but also from public goods g as soon as they live in a region and can desire some level of public goods, which is less than the level of public goods desired by inhabitants.

Governors benefit from being reappointed as well as from spending public funds in their own favor; they must decide on how to allocate resources between g , j and e .

Recall that there are two types of governors - “new bureaucrats” and “old bureaucrats”. A “new governor” (“new bureaucrat”) NG who is appointed by the Federal government and totally un beholden to local interests, cannot benefit from the local elite and has no incentives to bribe it. He decides how to allocate resources between g and e .

An “old governor” OG who got elected before new appointments were instituted, may have been appointed or waiting for appointment. For him to have succeeded means that he relied on the support of the local elite but to keep going, he must please the Federal government. Thus, he decides how to allocate resources between g , j and e .

First consider a *new governor*, NG . The probability of his reappointment depends on the interests of the Federal government, namely desirable results of elections⁹ (high share of the ruling party) s which is dependent on the effects of his public goods spending g as well as a parameter s_0 , reflecting initial conditions in terms of support of the ruling party by residents in his region. As long as an increase of g results in an increase of $f(g)$ and benefits residents, it leads to an increase of the support of the ruling party. So we assume that the probability of his reappointment $S(s_0, g)$ is linear in s_0 and a concave in g : $S_g(s_0, g) > 0$, $S_{gg}(s_0, g) < 0$. We also assume that $S(s_0, 0) = s_0$ which implies that if a governor does not spend on public goods, he cannot increase the share of the ruling party and his chances to be reappointed. To be reappointed, he must ensure that the share of the ruling party s , exceeds some target level \bar{s} , where $0 < \bar{s} < 1$. We also assume that $S(0, g) < \bar{s}$, which implies that if there is no initial support of the ruling party, then public resources will not be sufficient to reach \bar{s} .

⁹ The importance of electoral results for governors’ appointment or replacement as well as the weak effect of regional performance is well documented (see e.g. Turovskii, 2009; Golosov, 2008). This suggests that when deciding about governors’ appointment or replacement, the federal government shows little concern for the social and economic situation locally.

There is some work attempting to make a quantitative assessment of the factors crucial for the renewal and replacement of governors (Reuter and Robertson, 2011; Reisinger and Moraski, 2011). None of this work contradicts the presumption of weak regional effects.

Thus, a new governor *NG* with no local interests chooses g and e to maximize his utility function:

$$U^{NG} = Pr (s > \bar{s}) + t(e) = Pr (S(s_0, g) > \bar{s}) + t(e)$$

subject to the budget constraint

$$I = e + g.$$

We now turn to the behavior of “*old governors*”. Like new governors, old governors derive utility from the probability of being reappointed and the benefits from appropriating public funds, e . Unlike for *new governors*, however, their probability of being reappointed depends not only on residents’ (population) support, but also on the support of the local elite¹⁰. So the probability of reappointment $Pr (S(s_0, g, j) > \bar{s})$ is driven by spending on public goods g , support from local elites and the initial share of the ruling party s_0 . We assume that the support of the local elites is driven by transfers or bribes j from the governors to those elites. We assume that only old governors can use the local elite to provide the required voters.¹¹ Thus old governors can use two technologies to ensure a target level \bar{s} . They can either spend more on public goods g to get support of residents or bribe the local elite (j) which might help them to cheat with elections. Thus their probability of being appointed is a function for initial conditions s_0 , spending on public goods g and bribing of local elite j . We assume $S_g(s_0, g, j) > 0$, $S_{gg}(s_0, g, j) < 0$, $S_j(s_0, g, j) > 0$, $S_{jj}(s_0, g, j) < 0$, $S_{gj}(s_0, g, j) > 0^{12}$, $S(s_0, 0, 0) = s_0$ and $S(0, g, j) < \bar{s}$. We

¹⁰ Local elites might help OGs to achieve the required share of the ruling party e.g. through cheating on elections.

¹¹ This assumption seems natural in light of the well documented difficulties new governors have with local elites (e.g. Turovskii, 2009). Moreover, there have been cases when new governors were replaced because they were not able to get good relations with local elites (Amur oblast and Irkutsk oblast in 2008). New governors’ problems with local elite might have different roots, such as their lack of experience and/or lack of respect from the local population. Another reason is that the local elite might have a patron representing one group of interests in the federal elite, while a new governor could be part of another group of interests. These groups of special interests might compete with each other for federal and regional funds, political power, etc. So appointment of a new governor might mean the victory of one group of special federal interests over another. Local elites and their patrons could not prevent such appointments but sometimes could organize scandals in media or strong opposition in a regional legislature or simply not help new governors with elections. In turn, a new governor tries to grab local business and control over state funds – partly for himself, partly in favor of his interest groups. At any rate, it is simply more costly for new governors to get local support.

¹² It implies that these two technologies of providing a required share of the ruling party are complements, that is if both technologies are used together, they give more votes than if used separately.

assume also that for given s_0 , the Hessian of the function $S(s_0, g, j)$ is negative definite, that is $S_{gg}(s_0, g, j) \cdot S_{jj}(s_0, g, j) > S_{gj}(s_0, g, j) \cdot S_{jg}(s_0, g, j)$.

Moreover we assume that old governors benefit somewhat from public goods provision g as soon as they live in the region they govern for long time and their families also live there¹³.

Thus their utility function is:

$$U^{OG} = Pr (S(s_0, g, j) > \bar{s}) + t(e) + U^{population} = Pr (S(g, j, s_0) > \bar{s}) + t(e) + nf(g)$$

$0 < n \ll 1$ is a factor which takes into account the fact that the volume of public goods desired by the local elite is much smaller, than the volume of public goods desired by residents (inhabitants).

So an *OG* will maximize U^{OG} by choosing the level of public spending, rents for himself and for the local elites that satisfy his budget constraint

$$I = e + j + g.$$

It should be mentioned that we are not interested in how a governor redistributes resources between j and e , we are interested in how he redistributes between g and $(j + e)$ since only g matters for the wellbeing of inhabitants not how the governor and local elite share public funds between themselves.

We now derive the following three propositions the results of which will be tested in Section 4.

Proposition 1. If $s_0 \rightarrow 0$, then $g_{NG} < g_{OG}$.

Proof. If $s_0 \rightarrow 0$, then $Pr (S(s_0, g) > \bar{s}) \rightarrow 0$ and a new governor *NG* will spend nothing on g but appropriates everything. His utility function reaches the maximum when $U^{NG} = t(e)$. An old governor *OG* will provide some public goods g to benefit from public goods for himself because of the term $nf(g)$ in his utility function Thus, a new governor will provide fewer public goods than an old governor: $g_{NG} < g_{OG}$.

¹³ Unlike *OG*, *NG* often lived in a different region and their families often stay there.

Proposition 2. If $s_0 \rightarrow 1$, then $g_{NG} < g_{OG}$.

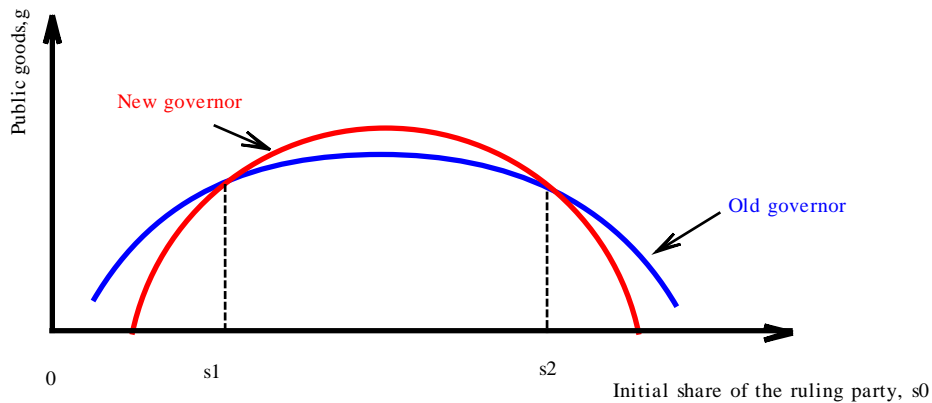
Proof. If $s_0 \rightarrow 1$, then $Pr(S(s_0, g) > \bar{s}) \rightarrow 1$ and NG will spend nothing on g but appropriates everything, his utility function reaches the max when $U^{NG} = 1 + t(e)$. Unlike NG , OG provides some public goods g : $U^{OG} = 1 + t(e) + nf(g)$. Thus $g_{NG} < g_{OG}$,

Proposition 3. If $0 < s_0 < 1$, then $g_{NG} > g_{OG}$.

Proof. If $0 < s_0 < 1$, then $0 < Pr < 1$ and to ensure \bar{s} , OG can use two technologies to get the desired share of the ruling party, namely providing public goods g as well as bribing local elite j , whereas NG can use only one technology through public goods provision. Because probability functions for NG are concave in g ($S_g(s_0, g) > 0$, $S_{gg}(s_0, g) < 0$ for NG s as well for OG as $S_g(s_0, g, j) > 0$, $S_{gg}(s_0, g, j) < 0$ for OG s), and taking into account that the Hessian of the OG 's function $S(s_0, g, j)$ is negative definite for given s_0 , then to get the equal level of probability, NG must spend more on g than OG , because OG can split between j and g . So a marginal ruble spent on g and j by OG will give more additional s (especially taking into account that $S_{g,j}(s_0, g, j) > 0$), than a marginal ruble spent on g by NG . Thus $g_{NG} > g_{OG}$.

The relationships between the initial share of the ruling party and public goods provision for the two types of governors are shown in Figure 3.

Figure 3. Relations between share of the ruling party and public goods for OG s and NG s



4. Model specification and estimation results

4.1. Data

To test the hypotheses outlined above, we estimate the relationship between public goods provision, the share of the ruling party and governors' career paths ("new bureaucrats" vs "old bureaucrats"). We collected data for 74 Russian regions for 2004-2009¹⁴, resulting in an unbalanced panel with 216 year*region observations¹⁵.

Data on *economic performance and spending on public goods* come from Rosstat. Data on *political variables* are collected by the authors from the database of the Central Election Commission of the Russian Federation, from the Russian Inter-Regional Electoral Support Network and from other sources. Data on *governors' characteristics* such as their age, mostly business vs. political background, time of keeping governor' office, insiders or outsiders (resident/nonresident) of the regions they govern are also collected by the author from official biographies of Russian governors as well as from other open sources like magazines and newspapers. A summary of these data appears in Appendix B.

It should be mentioned, that Russian electoral statistics contain data concerning which political party represents deputies only for the new voting systems with mixed-proportional or proportional voting rules. Results of elections by the majoritarian rule do not include data concerning elected deputies and the political parties to which they belong.

¹⁴ The list of the Russian regions we take into consideration is in *Appendix A*. It is worth mentioning that in 2001 the Russian Federation had 89 regions – subjects of the Federation. By 2009 the Russian Federation includes only 83 regions. Some of the region during 2005-2008 were included in other regions and stopped existing as a subject of the Russian Federation, so we do not take them into consideration. We also excluded Chechen Republic as well as Yamalo-Nenets Autonomous Okrug and Khanty-Mansi Autonomous Okrug because Rosstat does not provide data for all periods for them. Moreover we do not include Kemerovo Oblast because in this region there were no elections using the new voting system before October 2008. This means that elected by new rules legislature could not effect budget spending for 2009. Also we do not include the Tuva Republic and Sverdlovsk Oblast which have two chambers in their legislatures.

¹⁵ The number of observations is determined by date of elections in regional legislatures. In some regions elections using the new voting system took place in 2003, in others this happened only in 2007. Thus, if the voting in a region was only in 2007, there are observations for 2004-2006, and if elections took place in 2005, we have no data for 2004. The date of elections using the new voting rule was dependent on the date of previous elections and on the date where the term for a legislature expired. Moreover due to a budget process, a legislature or a governor can influence only budget spending which occurs at least one year after elections or appointment. Furthermore if elections or appointment took place after September, then a new governor or a new legislature could affect budget spending only two years later, since decisions were taken by their predecessors.

Dependent variables. We follow Enikolopov and Zhuravaskaya (2007), Zhuravskaya and Persson (2011) and consider two types of public goods—education and health care¹⁶. In both cases, we focus mostly on inputs, because we want to look at the motivation and efforts of the regional tier of government, whereas outcomes and outputs are dependent not only on the efforts of the regional government but also on those of the federal government, especially in health care¹⁷. Multiple sources of public education and health care funding make the task of identifying the effects of each source on outcomes (e.g. infant mortality rate or quality of education) very difficult. This problem becomes more intractable taking into account the heavily unbalanced data with only 3-4 year time series for most regions. Moreover if in the first year a decision to spend some money on education or health care was made, then the next year it was funded and only in the third year would the very first signs of the impact of spending possibly occur if at all. Thus, while we might think that examining the effects of spending would be very useful that is a separate and formidable challenge outside the scope of the current paper.

For *public education* services, we use the share of education spending in the total spending of regional budgets as well as public spending per student (for ages 0 to 18¹⁸) as measures of education inputs. For both input measures we have data for all periods.

It is worth mentioning that Russia suffers from a declining population and a decreasing number of children. Some regions suffer more from this, others less. In general, a low number of students per teacher as well as a low number of students per class may result from the lack of demand due to small cohorts of children rather than from state policy.

When studying *public health care*, we treat public spending on health care as well as the share of health care in total spending of regional budgets as measures of inputs. We should mention that the share of health care spending is a much less representative for health care

¹⁶ Enikopolov and Zhuravskaya (2007), Zhuravskaya and Persson (2011) also look at infrastructure. We did not for the reasons that are explained in this paragraph.

¹⁷ Funding of public health care in Russian regions has four primary sources – state obligatory health care insurance funds, the federal budget, regional budgets, and municipal budgets.

¹⁸It should be noted that regional budgets are also responsible for public kindergartens.

inputs, because it is heavily determined by the size of regional budgets as well as other types of public spending. Health care spending in per capita terms might increase while the share decreases.

Political variables. To describe the situation in the executive branch of a region, we use a dummy capturing the differences between appointed governors who have never been elected (new governors) and old governors (see Figure 1 above).

For the legislative branch, we use two measures of the intensity of political competition: the share of seats of the national ruling party “United Russia” as well as the Herfindahl-Hirschman Index (HHI). We note that the HHI is heavily dependent on requirements concerning the minimum number of votes for a political party to get a seat in regional legislatures. It varies from 3% of all voters to 10%.

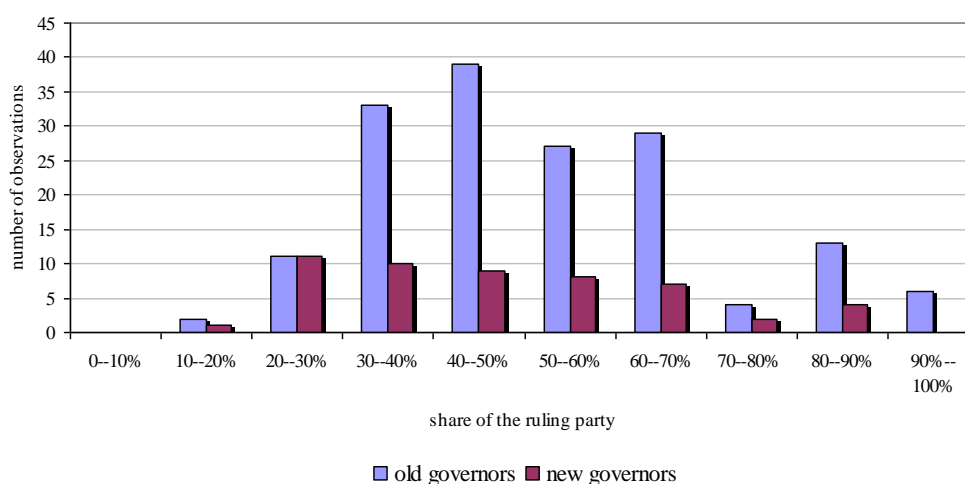
The main limitation of this empirical strategy is that before 2004 there was a majoritarian election rule in Russia, and Russian electoral statistics do not contain information about the political party that a candidate represented. Therefore we can only control for political competition in regional legislatures since 2004. As mentioned before, governors (or a legislature) can influence budget spending only in the year after they took office. Thus if they were elected or appointed they can adopt a budget for the next year but not for the current year. Moreover, when elections or an appointment take place in the fourth quarter of the year, then they can affect the budget only after two years.

We deal with an unbalanced panel, because the elections adopting new voting rules took place only after the expiration of the mandates of representatives. This happened at different moments in different regions.

Since the stylized model predicts a non-monotonic effect of political competition on spending, we include linear and quadratic interaction terms between the dummy for new as well as for old governors and the share of the “United Russia” party.

We run two types of regressions. In the first type of specification, we include both quadratic and linear interaction terms, while in second type we use only linear interaction terms. We run both types of regressions because we have only 33 observations for which the share of the ruling party is less than 35%. The other 183 observations have higher values and 129 among these are higher than 50%. Therefore, we may not be able to estimate with much confidence the whole curve predicted by the theoretical model described in Section 3 (see Figure 4).

Figure 4. Distribution of observations according to share of the ruling party



Economic control variables. We use regional total budget spending as well as the share of federal transfers in total regional public revenues as control variable¹⁹s. Households' money income is used to control for differences between rich and poor regions. All variables are in constant 2003 prices.

¹⁹ There was no direct link between federal and local spending on education as the federal government finances mostly higher level education, whereas primary and secondary education is financed primarily by municipal public budgets. Unlike spending on primary and secondary education, funding of public health care in regions have four primarily sources – state obligatory health care insurance fund, federal budget, regional budgets and municipal budgets. These types of public funds finance different types of healthcare expenditures and there is no almost their overlapping.

Governors' background control variables. We follow Zhuravskaya et al. (2011) here and control for governors' age, their mostly business vs. political background²⁰, time during which they were holding the governor's office, whether they were insiders or outsiders (resident/nonresident of the regions they govern) in order to ensure that the difference between governors' decisions comes from different contracts which implies different incentives, not because people with different life experience or at different ages make different decisions (see Appendix C). We do not use the governors' scientific degrees because almost all of Russian governors have PhD in one or more fields, however many, if not most of these PhD degrees were simply bought and not earned.

Descriptive statistics for all variables appear in Appendix D.

4.2. Estimation strategy

In order to test the above stated hypotheses, we run the following fixed effects model:

$$g_{it} = \alpha_i + \rho_t + \beta_1 OG_{i(t-k)} + \beta_2 OG_{i(t-k)} s_{i(t-k)} + \beta_3 OG_{i(t-k)} s_{i(t-k)} s_{i(t-k)} + \beta_4 NG_{i(t-k)} + \beta_5 NG_{i(t-k)} s_{i(t-k)} + \beta_6 NG_{i(t-k)} s_{i(t-k)} s_{i(t-k)} + \beta_7 X_{i(t-1)} + \varepsilon_{it}$$

where subscript i stands regions and subscript t for years; subscript $k = 1$ if an appointment or election took place between January and September, while $k = 2$ – if an appointment or election took place between October and December; g_{it} is a measure of public goods provision (g in the model of Section 3); s_{it} is a measure of political competition in a regional parliament (s_0 in the theoretic model of Section 3); OG_{it} is a dummy for old governors, NG_{it} is a dummy for new governors; X_{it} is a vector of control variables, which includes regional public spending per capita, the share of federal transfers in total regional public revenues as well as governors' education and career path indicators. We also control for regions and year fixed effects (α_i and ρ_t).²¹

²⁰ Since most of the politicians in Russia have their own business (firms) or they have their interest (explicitly or implicitly) in business groups, one can't say definitely for a given governor whether political activity or business is his main activity.

²¹ For linear specifications we run following model: $g_{it} = \alpha_i + \rho_t + \beta_1 OG_{i(t-k)} + \beta_2 OG_{i(t-k)} s_{i(t-k)} + \beta_3 NG_{i(t-k)} + \beta_4 NG_{i(t-k)} s_{i(t-k)} + \beta_5 X_{it} + \varepsilon_{it}$

For the cases of inputs as dependent variables we run both Ordinary Least Squares (OLS) and Seemingly Unrelated Regressions (SUR) to estimate the model and correct for possible correlations between error terms and recover more efficient estimates

To check for robustness, we use two measures of the intensity of political competition in regional legislatures: the share of the ruling party and the Herfindahl-Hirschman Index.

4.3. Estimation results

4.3.1. Baseline results

Propositions 1 – 3 suggest that we should find that the curve of expenses of public goods for new governors lies below the curve of public goods for old governors when the share of the ruling party is either too big or too small, whereas new governors spend more on public goods than old governors when this share takes intermediate values. Since we expect a concave shape for spending on public goods, the sign of the coefficient picked up by the linear interaction term (quadratic interaction term) should be positive (negative). The intercept coefficients should be close to zero.

In most Russian regions one observes a high share for the ruling party (more than 35%); therefore, a negative sign on interaction terms in linear specifications is also possible. Our baseline results (when SUR is used) for inputs of public goods are presented in Figures 5 and 6, and in Table 1. Appendix E contains estimation results for OLS for the all considered measures of public goods.

We first consider quadratic specifications. In the specification where *spending on education per capita* is the dependant variable, we find expected statistically significant signs for the interaction terms. The maximum of spending on education per capita in regions with new governors is reached when the share of the ruling party is 44%.²²

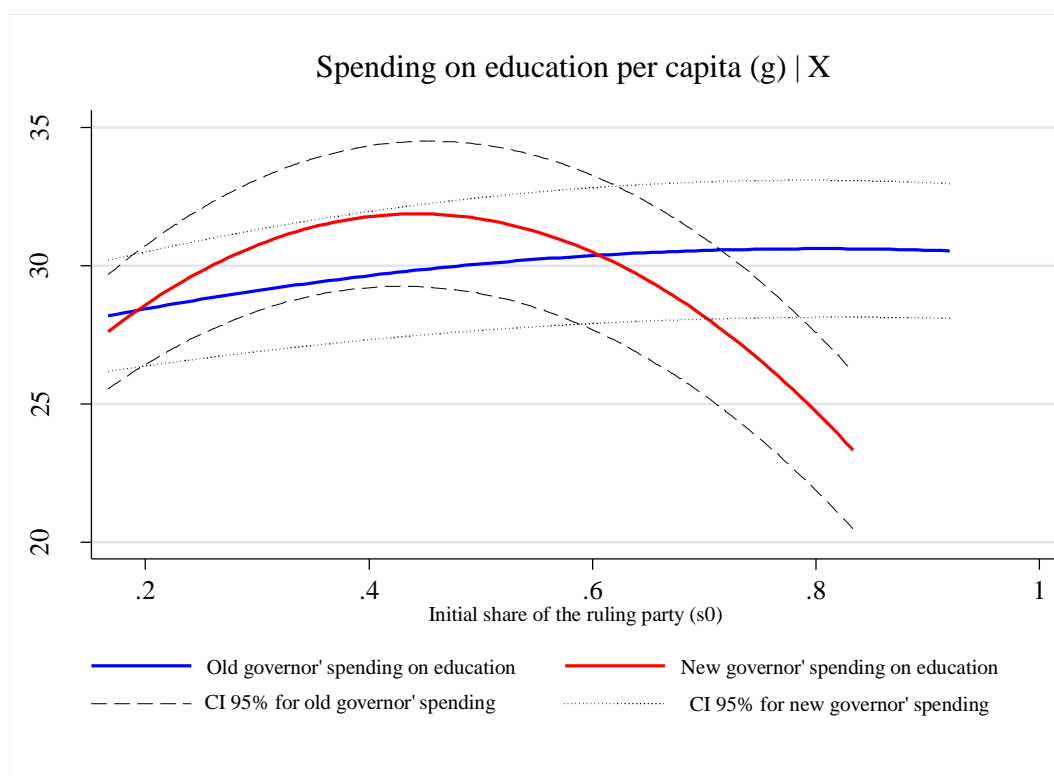
However, we fail to find statistically significant coefficients for old governors. Nevertheless our empirical findings are reasonably consistent with the model presented in

²² Maximum of the function: $-20.92 + 49.49s_0 - 55.93s_0^2$

Section 3. We find that if the share of the “United Russia” party is small or large (less than 19% or more than 61%), then new governors spend less on education in per capita terms than new governors, whereas if this share is not too big or too small (between 19% and 61%), then new governors spend more on public goods than old governors.

Though the point estimates go in the right direction and confirm the model of Section 3, we find that the confidence bands illustrated in Figure 5 are quite large, and recover each other except in the region of large shares of the ruling party (above 70%).

Figure 5. Spending on education per capita as a function of the share of the ruling party

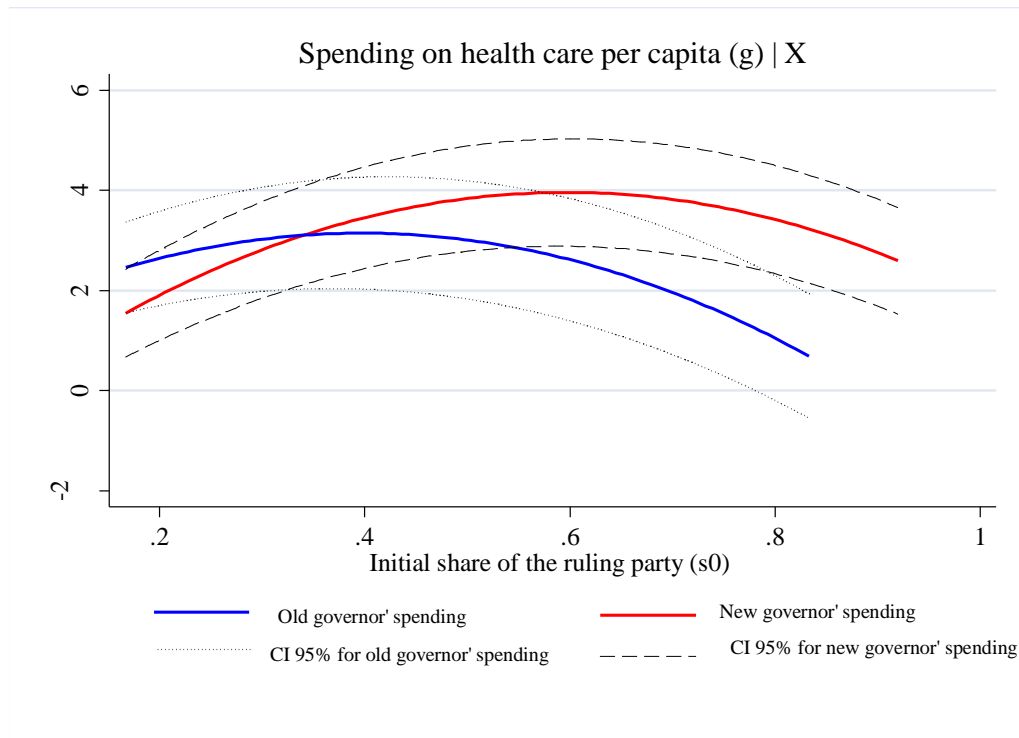


In the specification where the dependent variable is the *share of spending* on education, we find that new governors spend a higher share of public funds than old governors, but the coefficients are not significantly different from zero. See Table 1 and Appendix F, Figure 1.

For *health care per capita* as the dependent variable, all political variables have expected signs and all interaction terms are significant at the 5 – 10 % level (see Table 1). This gives some evidence supporting our hypothesis about the shape of spending on public goods for both types

of governors. Moreover we find evidence in favor of Propositions 1 and 2 from Section 3, whereas we fail to find evidence for Proposition 3 (see Figure 6).

Figure 6. Spending on health care per capita as a function of the share of the ruling party



In the case of *health care as a share of total spending* as the dependent variable, we find that the political variables which describe old governors are significant at the 1 – 5% level, whereas both linear and quadratic interaction terms for new governors fail to be statistically different from zero (see Table 1 and Appendix F, Figure 2).

Thus, for both cases of spending on education and health care in per capita terms, we have some evidence that supports Propositions 1 and 2. In the case of spending on education we also find empirical support for Proposition 3, while in the case of spending on health care we find the expected shape of the curve not only for new governors, but also for old governors.

Table 1. Quadratic specifications for spending on education and health care

| | Per capita | | Share of | |
|--|-----------------------|-------------------------|-----------------------|-------------------------|
| | spending on education | spending on health care | spending on education | spending on health care |
| | (1) | (2) | (3) | (4) |
| Dummy for old governor | 28.55 *** (8.01) | 0.70 (3.42) | 39.49*** (5.10) | 29.97*** (6.64) |
| Share of the ruling party x Dummy for old governor | 9.60 (15.55) | 15.54** (6.80) | -5.84 (10.10) | 45.72*** (13.17) |
| Share of the ruling party x Share of the ruling party x Dummy for old governor | -5.97 (14.37) | -13.02** (6.28) | 11.11 (9.33) | -37.45*** (12.17) |
| Dummy for new governor | 31.95*** (8.55) | 2.09 (3.64) | 41.62*** (5.64) | 41.20*** (7.35) |
| Share of the ruling party x Dummy for new governor | 49.49*** (14.55) | 10.26* (6.36) | -15.94* (9.45) | 1.77 (12.32) |
| Share of the ruling party x Share of the ruling party x Dummy for a new governor | -55.93*** (15.14) | -12.92** (6.62) | 17.56* (9.84) | -2.26 (12.82) |
| Households income per capita | -0.87 (2.55) | 1.40 (1.11) | -5.12*** (1.66) | -4.09* (2.16) |
| Regional budget revenues per capita | 0.35 (1.46) | -0.52 (0.65) | -3.46*** (0.96) | -5.39*** (1.25) |
| Share of federal transfers | -15.02 (3.32) | -1.04 (1.45) | -1.34 (2.16) | 3.12 (2.81) |
| Age of governor | -0.004 (0.08) | -0.04 (0.03) | -0.04 (0.05) | -0.18*** (0.07) |
| Dummy for businessman | -3.14 (1.40) | 0.22 (0.61) | 1.69* (0.91) | -0.84 (1.18) |
| Time keeping office | 0.05 (0.13) | 0.02 (0.06) | 0.07 (0.09) | 0.30 (0.11) |
| Dummy for governor-outsider | -0.75 (0.77) | 1.35*** (0.34) | 0.82 (0.50) | 0.86 (0.65) |
| Region fixed effect | yes | yes | yes | yes |
| Time fixed effect | yes | yes | yes | yes |
| Number of observations | 216 | 216 | 216 | 216 |

In Table 2, we consider linear specifications. We find the expected negative signs on the interaction terms between the share of the ruling party and the dummy for new governors for both spending on education and on health care as well as for both per capita and share terms (except for spending on education per capita). But the interaction terms are never statistically significantly different from zero²³. Thus, slope for new governors is negative: the bigger the share of the ruling party the less they spend on public goods. Moreover, if the share of the ruling

²³ At the same time regressions with the following specification $g_{it} = \alpha_i + \rho_t + \beta_1 NG_{i(t-k)} + \beta_2 S_{i(t-k)} + \beta_3 NG_{i(t-k)} S_{i(t-k)} + \beta_4 X_{it} + \varepsilon_{it}$, give us interaction terms, which are significant at 1-2% level for all measures of spending on education and health care. See *Appendix K*.

party is over than 30%,²⁴ then new governors spend less on public goods than old governors, whereas if the share of the ruling party is smaller, then old governors spend more on public goods, which is consistent with our model. However the sign of the coefficient for the interaction between the dummy for old governors and the share of the ruling party is positive. This implies that the bigger the share of the ruling party the more they spend on public goods.

Table 2. Linear specifications for spending on education and health care

| | Per capita | | Share of | |
|--|-----------------------|-------------------------|-----------------------|-------------------------|
| | spending on education | spending on health care | spending on education | spending on health care |
| | (1) | (2) | (3) | (4) |
| Dummy for old governor | 28.55*** (8.01) | 0.70 (3.41) | 38.16*** (5.05) | 33.10*** (6.72) |
| Share of the ruling party x Dummy for old governor | 7.49*** (2.67) | 2.13* (1.14) | 5.08*** (1.69) | 4.34* (2.24) |
| Dummy for new governor | 31.94*** (8.55) | 2.09 (3.64) | 39.40*** (5.39) | 36.65*** (7.17) |
| Share of the ruling party x Dummy for new governor | -2.79 (2.79) | -2.09 (1.19) | 0.70 (1.76) | -1.24 (2.34) |
| Households income per capita | -0.96 (2.64) | 1.41 (1.13) | -5.11*** (1.67) | -4.01* (2.22) |
| Regional budget revenues per capita | -0.13 (1.52) | -0.45 (0.65) | -3.45*** (0.96) | -4.85*** (1.28) |
| Share of federal transfers | -13.66 (3.38) | -0.36 (1.44) | -2.06 (2.13) | 4.35 (2.83) |
| Age of governor | -0.01 (0.08) | -0.01 (0.03) | -0.06 (0.05) | -0.11* (0.06) |
| Dummy for businessman | -1.67 (1.37) | 0.16 (0.58) | 1.55* (0.86) | -2.06* (1.15) |
| Time keeping office | -0.08 (0.13) | -0.01 (0.06) | 0.11 (0.08) | 0.31*** (0.11) |
| Dummy for governor-outsider | -0.13 (0.78) | 1.34*** (0.33) | 0.74 (0.49) | 0.41 (0.65) |
| Region fixed effect | yes | yes | yes | yes |
| Time fixed effect | yes | yes | yes | yes |
| Number of observations | 216 | 216 | 216 | 216 |

4.3.2. Robustness checks and discussion

²⁴ If the share of the “United Russia” party is higher than 33%, then old governors spend more on education and health care in per capita terms than new governors. If the share of “United Russia” is higher than 29%, then in regions with old governors the share of spending on education in total budget spending is bigger than in regions with new governors, whereas for a share of spending on health care the critical value of the ruling party is 58%.

To check whether our results might be sensitive to outliers, we constructed Figures 1 and 2 in Appendix G. There are two regions, which might be considered to be outliers. This is the Moscow oblast in 2008 for the case of the spending on education and Chukotka in 2007 for the case of the spending on health care.

To check whether our results are sensitive to outliers, we exclude the observation for the Moscow oblast in the case of spending on education per capita and run regressions with 215 observations. Results are presented in Figure 7 and Appendix H.

For the case of spending on health care we exclude the observation for Chukotka in 2007 and run regressions with 215 observations. Results are presented in Figure 8 and Appendix H. As can be seen, our finding concerning the shape of old' governors spending on health care is not sensitive to excluding these observations.

To check whether our results are sensitive to the way in which we measure the intensity of political competition, we replace the share of the ruling party by a Herfindahl-Hirschman Index (HHI), estimated for shares of political parties in regional legislatures. Results of estimation presented in Appendix I are similar to our baseline results with the share of "United Russia" only.

Finally, we use logarithms for spending on education and health care in per capita terms. In the quadratic specifications, we fail to find any evidence supporting Propositions 1 – 3. For linear specifications, we obtain results that might be seen supporting Propositions 2 – 3, even though coefficients for health care spending are not statistically different from zero. See Appendix J.

Figure 7. Spending on education per capita as a function of the share of the ruling party
(excluding the Moscow oblast in 2008)

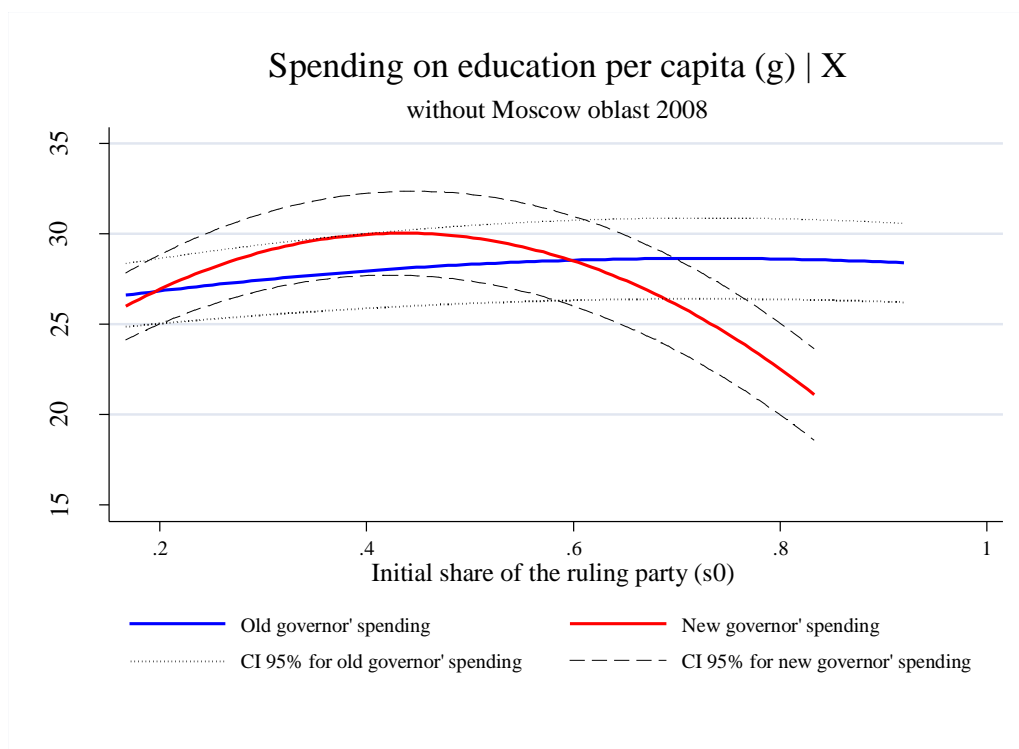
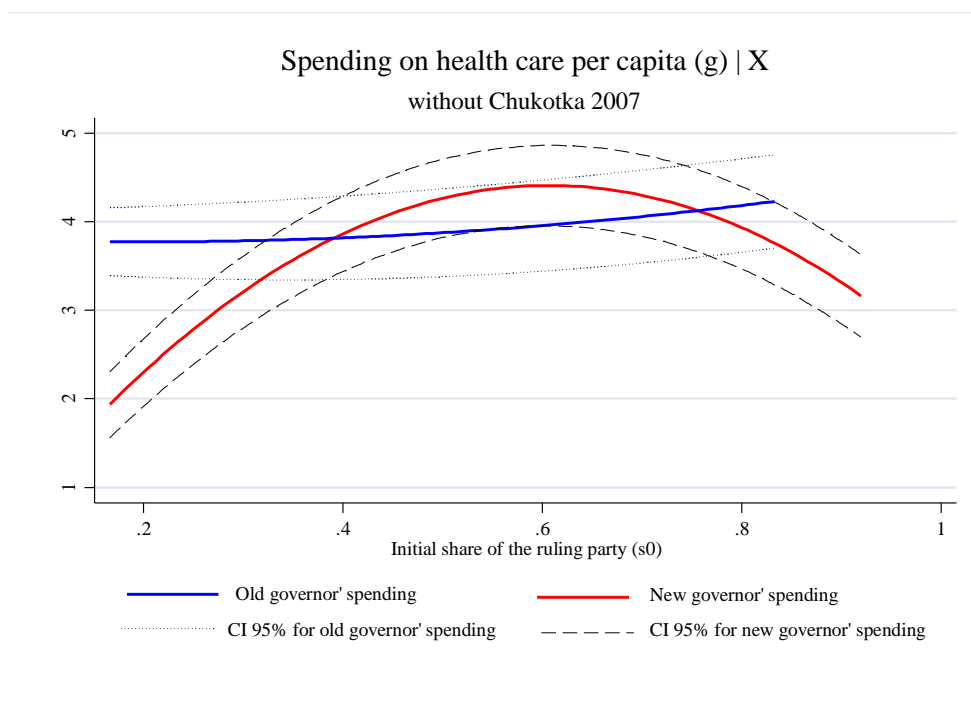


Figure 6. Spending on health care per capita as a function of the share of the ruling party
(excluding Chukotka in 2007)



The problem of reverse causality is an important challenge for estimating true effects. One may suppose that if old governors spend a lot on public goods, they will be appointed by the Federal government, while if they spend a little, they will not be able to keep their office. This implies that governors who do not spend enough on public goods are more likely to be replaced. This may imply that it is not the type of governor and their incentives which affects the level of spending on public goods, but the level of spending has an effect on whether a governor is reappointed or not. To address this issue we used lagged explanatory variables.

Of course this still doesn't strictly rule out the possibility that appointments are primarily driven by spending itself. An appropriate and rigorous identification technique is not readily apparent, particularly given the short period of the time series. However, expert claims in the literature indicate that when considering the appointment issue, the federal government seems to care about neither the social spending nor the social performance of a region but only about the formal electoral support of the ruling party²⁵. While not definitive, these opinions support our view that the way governors are appointed determines the size of social spending, and not vice versa. Of course, it is still the case that more effort needs to be made in future research to eliminate the possibility of reverse causation.

5. Conclusion

In this paper we have tried to answer the question of the effects of political competition on public goods provision in nations with poorly-developed democratic institutions. We argue that political competition matters even in a limited democracy. The intensity of political competition defines what types of accountability mechanisms (formal vs. informal) work better in favor of residents, but their impact is non-monotonic. We find some evidence for our

²⁵ For instance, Gel'man and Ryzhenkov (2011) consider "vertical power" as the tool used to provide the Kremlin's desired electoral results, but this tool is not connected with solving the regions' and cities' problems. Turovskii (2009) also supports this view that the social and economic performance of a region is not truly used as a criterion for a governor's reappointment or replacement.

hypotheses by using data from Russian regions for 2004-2009. We show that in regions in which the political power of one party is very important, increased administrative subordination of executives is associated with fewer public goods such as expenses on public health care and public education. In contrast, informal mechanisms of accountability of local executives (such as networking or local political pressure) often work worse in heavily competitive environments.

Moreover, we find that the relationship between the intensity of political competition, efficiency of accountability mechanisms, and public goods (such as education and health care) are not monotonic with locally elected officials providing more goods than centrally appointed governors when ruling party power is strong and the opposite effect when the share of the ruling party is low.

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Appendix A. List of 74 Russian regions, included in our sample

| | | |
|--------------------------------|---------------------------|----------------------------------|
| Altai Krai | Kursk Oblast | Sakha Republic |
| Amur Oblast | Leningrad Oblast | Republic of North Ossetia-Alania |
| Arkhangelsk Oblast | Lipetsk Oblast | Republic of Tatarstan |
| Astrakhan Oblast | Magadan Oblast | Republic of Khakassia |
| Belgorod Oblast | Moscow Oblast | Rostov Oblast |
| Bryansk Oblast | Murmansk Oblast | Ryazan Oblast |
| Vladimir Oblast | Nizhny Novgorod Oblast | Samara Oblast |
| Volgograd Oblast | Novgorod Oblast | Saratov Oblast |
| Vologda Oblast | Novosibirsk Oblast | Sakhalin Oblast |
| Voronezh Oblast | Omsk Oblast | Smolensk Oblast |
| federal city of Moscow | Oryol Oblast | Stavropol Krai |
| federal city of St. Petersburg | Penza Oblast | Tambov Oblast |
| Jewish Autonomous Oblast | Perm Krai | Tver Oblast |
| Ivanovo Oblast | Primorsky Krai | Tomsk Oblast |
| Irkutsk Oblast | Pskov Oblast | Tula Oblast |
| Kabardino-Balkar Republic | Republic of Adygea | Tyumen Oblast |
| Kaliningrad Oblast | Altai Republic | Udmurt Republic |
| Kaluga Oblast | Republic of Bashkortostan | Ulyanovsk Oblast |
| Karachay-Cherkess Republic | Buryat Republic | Khabarovsk Krai |
| Kamchatka Krai | Republic of Ingushetia | Chelyabinsk Oblast |
| Kirov Oblast | Republic of Kalmykia | Zabaykalsky Krai |
| Kostroma Oblast | Republic of Karelia | Chuvash Republic |
| Krasnodar Krai | Komi Republic | Chukotka Autonomous Okrug |
| Krasnoyarsk Krai | Mari El Republic | Yaroslavl Oblast |
| Kurgan Oblast | Republic of Mordovia | |

Appendix B. Data summary

| Indicator | Description |
|-------------------------------------|---|
| Age of governor | Age of a governor in a region. Source: Data are collected by author from open sources. |
| Dummy for new governor | Dummy for governors-“new bureaucrats”, who have never been elected but only appointed by federal government (new governors) (1) or governors – “old bureaucrats” (old governors) (0). Source: Data are collected by author from open sources |
| Dummy for businessman | Dummy for governors who have mostly business background (1) or political background (0). Source: Data are collected by author from open sources |
| Dummy for governor-outsider | Dummy for Governor is an outsider (nonresident of the region he/she governs) (1) or an insider (resident of a region) (0). Source: Data are collected by author from open sources |
| HHI | Logarithm of the Herfindahl–Hirschman Index, estimated for political parties in a regional legislature. Source of primary data: Russian Inter-Regional Electoral Support Network (http://db.irena.org.ru/). |
| Households income per capita | Logarithm of households money income per capita in a region, in constant 2003 prices. Source: Rosstat (http://www.gks.ru). |
| Infant mortality rate | Number of deaths of children at age 0-1 year per 1000 births in a region. Source: Rosstat (http://www.gks.ru) |
| Number of computers | Number of computers in public schools per 100 students in a region. Source: Rosstat (http://www.gks.ru) |
| Number of inhabitants per bed | Number of inhabitants per a bed in public hospitals in a region. Source: Rosstat (http://www.gks.ru) |
| Number of inhabitants per doctor | Number of inhabitants per a doctor in a region. Source: Rosstat (http://www.gks.ru) |
| Number of students per class | Number of students per class in public schools in a region. Source: Rosstat (http://www.gks.ru) |
| Regional budget revenues per capita | Logarithm of regional budget revenues per capita in constant 2003 prices. Source: Rosstat (http://www.gks.ru). |
| Share of federal transfers | Share of current federal transfers in total revenues of regional budgets. Source: Rosstat (http://www.gks.ru). |
| Share of spending on education | Share of spending on education in a total regional budget spending. Source: Rosstat (http://www.gks.ru) |

| | |
|------------------------------------|---|
| Share of spending on health care | Share of spending on health care in a total regional budget spending. Source: Rosstat (http://www.gks.ru) |
| Share of the ruling party | Share of seats of the national ruling party – “United Russia” in a total number of seats in a regional legislature allocated by voting for party lists. Source: Russian Inter-Regional Electoral Support Network (http://db.irena.org.ru/). |
| Spending on education per capita | Spending of regional budgets on education per a person at age from 0 till 18 years, in constant 2003 prices. Source: Rosstat (http://www.gks.ru) |
| Spending on health care per capita | Spending of regional budgets on health care per capita, in constant 2003 prices. Source: Rosstat (http://www.gks.ru) |
| Time in office | Time, during which a governor keeps the office. Source: Data are collected by author from open sources. |
| Total mortality rate | Number of deaths per 1000 inhabitants in a region. Source: Rosstat (http://www.gks.ru) |

Appendix C. Governors' characteristics

Figure 1. Share of the governors-outsiders (non-residents) in total number of Russian governors

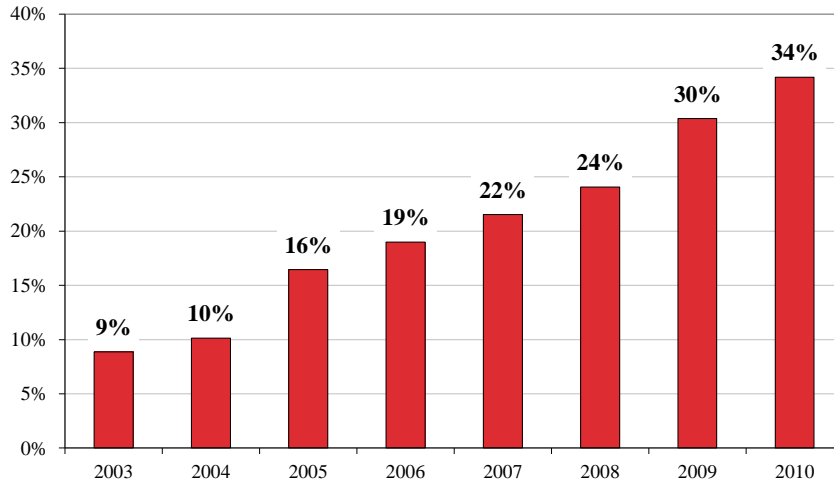


Figure 2. Share of the governors with mostly political background (not businessmen) in total number of Russian governors

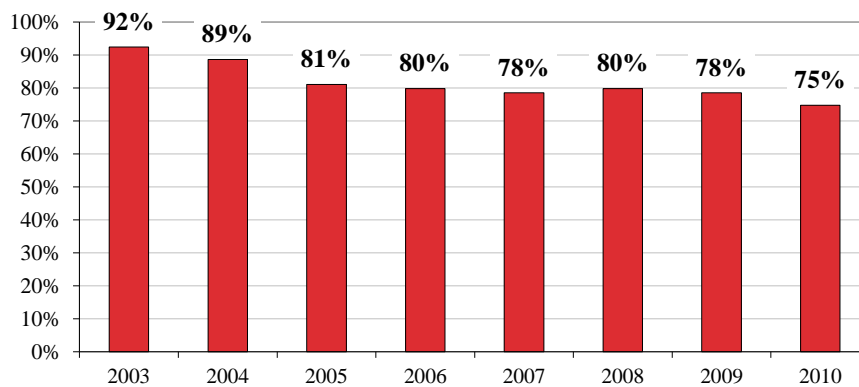


Figure 3. Average time during which Russian governors keep their offices (in years)

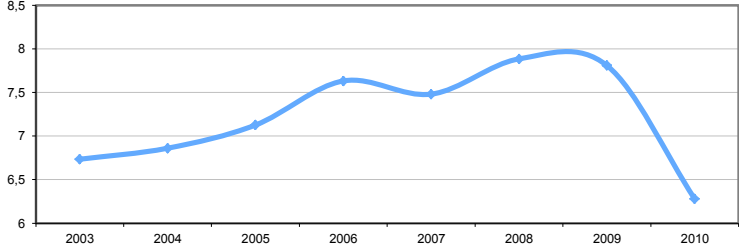
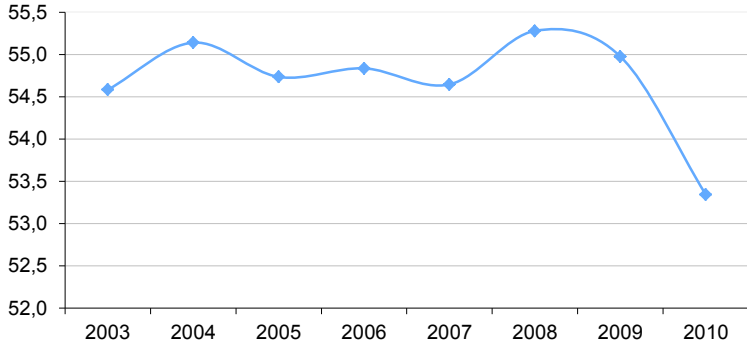


Figure 4. Average age of Russian governors (in years)



Appendix D. Descriptive statistics

| | Mean | Maximum | Minimum | Std. Dev. | Obs. |
|--------------------------------------|--------|---------|---------|-----------|------|
| Age of governor | 54.2 | 75.0 | 34.0 | 7.8 | 216 |
| Dummy for new governor | 0.2 | 1.0 | 0.0 | 0.4 | 216 |
| Dummy for businessman | 0.8 | 1.0 | 0.0 | 0.4 | 216 |
| Dummy for governor-outsider | 0.3 | 1.0 | 0.0 | 0.4 | 216 |
| HHI | 3723.6 | 8915.4 | 1584.5 | 1707.7 | 216 |
| Households income per capita | 6.9 | 24.0 | 1.9 | 3.3 | 216 |
| Infant mortality rate | 9.3 | 31.4 | 4.5 | 3.2 | 216 |
| Number of computers | 3.8 | 8.2 | 1.2 | 0.9 | 127 |
| Number of inhabitants per bed | 97.8 | 253.2 | 41.4 | 27.6 | 216 |
| Number of inhabitants per doctor | 226.7 | 432.1 | 114.4 | 56.3 | 216 |
| Number of students per class | 17.0 | 30.0 | 11.0 | 3.1 | 137 |
| Regional budgets revenues per capita | 21.5 | 224.3 | 7.5 | 24.0 | 216 |
| Share of federal transfers | 0.4 | 0.9 | -0.2 | 0.2 | 216 |
| Share of spending on education | 23.5 | 33.3 | 11.4 | 3.8 | 216 |
| Share of spending on health care | 14.2 | 23.2 | 3.1 | 3.6 | 216 |
| Share of the ruling party | 0.5 | 0.9 | 0.2 | 0.2 | 216 |
| Spending on education per capita | 23.3 | 130.1 | 1.6 | 20.6 | 216 |
| Spending on health care per capita | 2.8 | 17.9 | 1.0 | 1.9 | 216 |
| Time keeping office | 7.6 | 20.0 | 1.0 | 5.3 | 216 |
| Total mortality rate | 14.9 | 21.7 | 3.1 | 3.1 | 216 |

Appendix E. Specifications for outputs and outcomes as the dependant variables with share of
the ruling party as a proxy for intensity of political competition
in regional legislatures

Table 1. Quadratic specifications for spending on health care and education with share of the
ruling party as a proxy for intensity of political competition in regional
legislatures

| | Spending on | | | |
|--|----------------------|---------------------------------|-------------------|---------------------------------|
| | education | | health care | |
| | per capita | as a share of total spending | per capita | as a share of total spending |
| | (1) | (2) | (3) | (4) |
| Dummy for old governor | 26.75*** (10.27) | 39.49*** (6.67) | -0.68 (4.49) | 29.98*** (8.70) |
| Share of the ruling party x Dummy for old governor | 9.60 (20.36) | -5.84 (13.23) | 15.54** (8.90) | 45.72*** (17.24) |
| Share of the ruling party x Share of the ruling party x Dummy for old governor | -5.97 (18.81) | 11.11 (12.22) | -13.02 (8.22) | -37.45** (15.93) |
| Dummy for new governor | 20.92* (11.36) | 41.62*** (7.38) | 1.11 (4.97) | 41.20*** (9.62) |
| Share of the ruling party x Dummy for new governor | 49.49*** (19.05) | -15.94 (12.38) | 10.26 (8.33) | 1.77 (16.13) |
| Share of the ruling party x Share of the ruling party x Dummy for new governor | -55.93*** (19.83) | 17.56 (12.88) | -12.92 (8.67) | -2.26 (16.79) |
| Households income per capita | -0.87 (3.35) | -5.12** (2.17) | 1.40 (1.46) | -4.09 (2.82) |
| Regional budget revenue per capita | 0.35 (1.93) | -3.46*** (1.26) | -0.52 (0.85) | -5.39*** (1.64) |
| Share of federal transfers | -15.02*** (4.35) | -1.34 (2.83) | -1.04 (1.90) | 3.12 (3.69) |
| Age of governor | -0.004 (0.10) | -0.04 (0.07) | -0.04 (0.04) | -0.18** (0.09) |
| Dummy for businessman governor | -3.14* (1.83) | 1.69 (1.19) | 0.22 (0.80) | -0.84 (1.55) |
| Time in office | 0.05 (0.17) | 0.07 (0.11) | 0.02 (0.08) | 0.30** (0.15) |
| Dummy for governor-outsider | -0.75 (1.01) | 0.82 (0.66) | 1.35*** (0.44) | 0.86 (0.85) |
| Region fixed effect | yes | yes | yes | yes |
| Time fixed effect | yes | yes | yes | yes |
| Number of observations | 216 | 216 | 216 | 216 |
| R ² : within | 0.59 | 0.50 | 0.27 | 0.72 |

Table 2. Linear specifications for spending on health care and education with share of the ruling party as a proxy for intensity of political competition in regional legislatures

| | Spending on | | | |
|--|---------------------|------------------------------|-------------------|------------------------------|
| | education | | health care | |
| | per capita | as a share of total spending | per capita | as a share of total spending |
| | (1) | (2) | (3) | (4) |
| Dummy for old governor | 28.55*** (10.41) | 38.16*** (6.56) | 0.70 (4.44) | 33.10*** (8.73) |
| Share of the ruling party x Dummy for old governor | 7.49** (3.47) | 5.08*** (2.20) | 2.13 (1.48) | 4.34 (2.91) |
| Dummy for new governor | 31.95*** (11.10) | 39.40*** (7.00) | 2.09 (4.73) | 36.65*** (9.31) |
| Share of the ruling party x Dummy for new governor | -2.79 (3.63) | 0.70 (2.29) | -2.09 (1.55) | -1.24 (3.04) |
| Households income per capita | 0.96 (3.44) | -5.11** (2.17) | 1.41 (1.46) | -4.01 (2.88) |
| Regional budget revenues per capita | -0.13 (1.98) | -3.45*** (1.24) | -0.45 (0.84) | -4.85*** (1.66) |
| Share of federal transfers | -13.66*** (4.39) | -2.06 (2.77) | 0.36 (1.87) | 4.35 (3.68) |
| Age of governor | 0.01 (0.10) | -0.06 (0.06) | -0.01 (0.04) | -0.11 (0.08) |
| Dummy for businessman | -1.67 (1.77) | 1.55 (1.12) | 0.16 (0.76) | -2.06 (1.49) |
| Time keeping office | 0.08 (0.13) | 0.11 (0.11) | -0.01 (0.07) | 0.31** (0.15) |
| Dummy for governor-outsider | -0.13 (1.01) | 0.74 (0.64) | 1.34*** (0.43) | 0.41 (0.85) |
| Region fixed effect | yes | yes | yes | yes |
| Time fixed effect | yes | yes | yes | yes |
| Number of observations | 216 | 216 | 216 | 216 |
| R ² : within | 0.56 | 0.49 | 0.25 | 0.70 |

Table 3. Quadratic specifications for education outputs with share of the ruling party as a proxy for intensity of political competition in regional legislatures

| | Number of students per class | Number of computers |
|---|---------------------------------|------------------------|
| | (1) | (2) |
| Dummy for old governor | 21.08 (12.76) | 1.98 (2.12) |
| Share of the ruling party x Dummy for old governor | -12.29 (13.76) | 2.87 (3.87) |
| Share of the ruling party x Share of the ruling party x Dummy for old governor | 3.32 (12.01) | -2.14 (3.49) |
| Dummy for new governor | 15.22 (14.98) | 1.35 (2.28) |
| Share of the ruling party x Dummy for new governor | 13.13 (18.72) | 4.77 (5.02) |
| Share of the ruling party x Share of the ruling party x Dummy for new governor | -18.07 (22.46) | -2.14 (4.88) |
| Households income per capita | 1.25 (1.95) | -0.79 (0.65) |
| Regional budget revenues per capita | -0.41 (2.09) | 0.62 (0.40) |
| Share of federal transfers | 2.64 (3.62) | 1.35 (1.10) |
| Age of governor | -0.04 (0.11) | 0.01 (0.02) |
| Dummy for businessman | -0.74 (4.51) | -0.07 (0.57) |
| Time keeping office | 0.05 (0.10) | 0.05 (0.05) |
| Dummy for governor-outsider | -0.66 (1.13) | 0.01 (0.26) |
| Region fixed effect | yes | yes |
| Time fixed effect | yes | yes |
| Number of observations | 137 | 127 |
| R ² : within | 0.33 | 0.83 |

Table 4. Linear specifications for education outputs with share of the ruling party as a proxy for intensity of political competition in regional legislatures

| | Number of students per class | Number of computers |
|--|------------------------------|---------------------|
| | (2) | (3) |
| Dummy for old governor | 26.22** (10.25) | 1.83 (2.01) |
| Share of the ruling party x Dummy for old governor | -8.31*** (1.93) | 0.60 (0.57) |
| Dummy for new governor | 24.16** (10.20) | 1.17 (2.17) |
| Share of the ruling party x Dummy for new governor | -1.68 (1.71) | 2.65*** (0.69) |
| Households income per capita | 0.88 (1.88) | -0.80 (0.62) |
| Regional budget revenues per capita | -0.13 (2.03) | 0.66* (0.37) |
| Share of federal transfers | 2.15 (3.53) | 1.62* (0.95) |
| Age of governor | -0.08 (0.09) | -0.001 (0.02) |
| Dummy for businessman | -4.10** (2.02) | -0.09 (0.36) |
| Time keeping office | 0.08 (0.09) | 0.04 (0.03) |
| Dummy for governor-outsider | -0.94 (1.00) | 0.000 (0.19) |
| Region fixed effect | yes | yes |
| Time fixed effect | yes | yes |
| Number of observations | 137 | 127 |
| R ² : within | 0.32 | 0.83 |

Table 5. Quadratic specifications for health care outputs and outcomes with share of the ruling party as a proxy for intensity of political competition in regional legislatures

| | Health care outputs | | Health care outcomes | |
|--|------------------------------------|---------------------------------|----------------------|-----------------------|
| | number of inhabitants per a doctor | number of inhabitants per a bed | total mortality rate | infant mortality rate |
| | (1) | (2) | (3) | (4) |
| Dummy for old governor | 290.49*** (26.36) | 130.20*** (21.76) | 13.28*** (1.59) | 3.79 (8.27) |
| Share of the ruling party x Dummy for old governor | 106.12** (47.25) | 20.97 (43.15) | 4.24 (3.14) | 29.13* (16.39) |
| Share of the ruling party x Share of the ruling party x Dummy for old governor | -105.89** (43.66) | -31.26 (39.87) | -3.61 (2.90) | -35.32** (15.14) |
| Dummy for new governor | 281.41*** (23.83) | 132.94*** (24.07) | 15.36*** (1.75) | 2.37 (9.14) |
| Share of the ruling party x Dummy for new governor | 62.85 (44.21) | 15.67 (40.38) | -7.33*** (2.94) | 28.81* (15.33) |
| Share of the ruling party x Share of the ruling party x Dummy for new governor | -63.07 (46.01) | -27.83 (42.02) | 8.64*** (3.06) | -37.67** (15.96) |
| Households income per capita | -0.44 (7.44) | 10.26 (7.07) | 0.21 (0.51) | -2.62 (2.68) |
| Regional budget revenues per capita | -8.64* (4.49) | -16.05*** (4.10) | -0.14 (0.30) | -1.74 (1.56) |
| Share of federal transfers | -2.73 (10.10) | -2.14 (9.22) | 0.19 (0.67) | 5.59 (3.50) |
| Age of governor | -0.35 (0.24) | -0.11 (0.22) | -0.003 (0.02) | 0.02 (0.08) |
| Dummy for businessman | 1.46 (4.24) | -0.23 (3.87) | 0.44 (0.28) | 3.89*** (1.47) |
| Time keeping office | 0.41 (0.40) | 0.08 (0.37) | -0.01 (0.03) | -0.19 (0.14) |
| Dummy for governor-outsider | 1.50 (2.34) | -0.56 (2.14) | 0.14 (0.16) | 2.62*** (0.81) |
| Region fixed effect | yes | yes | yes | yes |
| Time fixed effect | yes | yes | yes | yes |
| Number of observations | 216 | 216 | 216 | 216 |
| R ² : within | 0.25 | 0.69 | 0.74 | 0.52 |

Table 6. Linear specifications for health care outputs and outcomes with share of the ruling party as a proxy for intensity of political competition in regional legislatures

| | Health care outputs | | Health care outcomes | |
|--|------------------------------------|---------------------------------|----------------------|-----------------------|
| | number of inhabitants per a doctor | number of inhabitants per a bed | total mortality rate | infant mortality rate |
| | (1) | (2) | (3) | (4) |
| Dummy for old governor | 291.61*** (25.39) | 133.42*** (21.30) | 13.38*** (1.66) | 7.58 (8.30) |
| Share of the ruling party x Dummy for old governor | -6.29 (7.94) | -11.47 (7.11) | -0.47 (0.55) | -7.02*** (2.77) |
| Dummy for a new governor | 289.59*** (23.39) | 134.62*** (22.73) | 13.05*** (1.77) | 5.59 (8.85) |
| Share of the ruling party x Dummy for new governor | 1.52 (8.29) | -11.02 (7.42) | 0.64 (0.58) | -7.16** (2.89) |
| Households income per capita | -0.31 (7.86) | 10.29 (7.03) | 0.24 (0.55) | -2.61 (2.74) |
| Regional budget revenues per capita | -7.68* (4.52) | -15.86*** (4.04) | -0.003 (0.31) | -1.58 (1.57) |
| Share of federal transfers | 1.95 (10.04) | -0.56 (8.98) | 0.13 (0.70) | 7.50** (3.50) |
| Age of governor | -0.14 (0.23) | -0.05 (0.20) | 0.01 (0.02) | 0.08 (0.08) |
| Dummy for businessman | -0.32 (4.06) | -0.47 (3.63) | 0.06 (0.28) | 3.80*** (1.42) |
| Time keeping office | 0.29 (0.40) | 0.02 (0.36) | 0.01 (0.03) | -0.21** (0.14) |
| Dummy for governor-outsider | 0.93 (2.31) | -0.62 (2.07) | -0.02 (0.16) | 2.63*** (0.81) |
| Region fixed effect | yes | yes | yes | yes |
| Time fixed effect | yes | yes | yes | yes |
| Number of observations | 216 | 216 | 216 | 216 |
| R ² : within | 0.22 | 0.69 | 0.70 | 0.49 |

Appendix F. Figures of spending on education and health care in share terms

Figure 1. Share of spending on education in total public spending as a function of the share of the ruling party

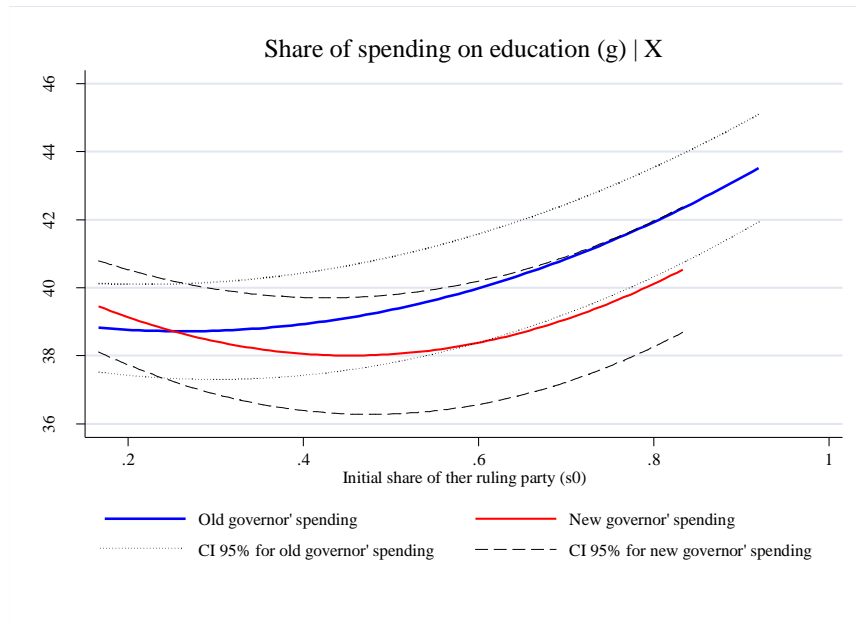
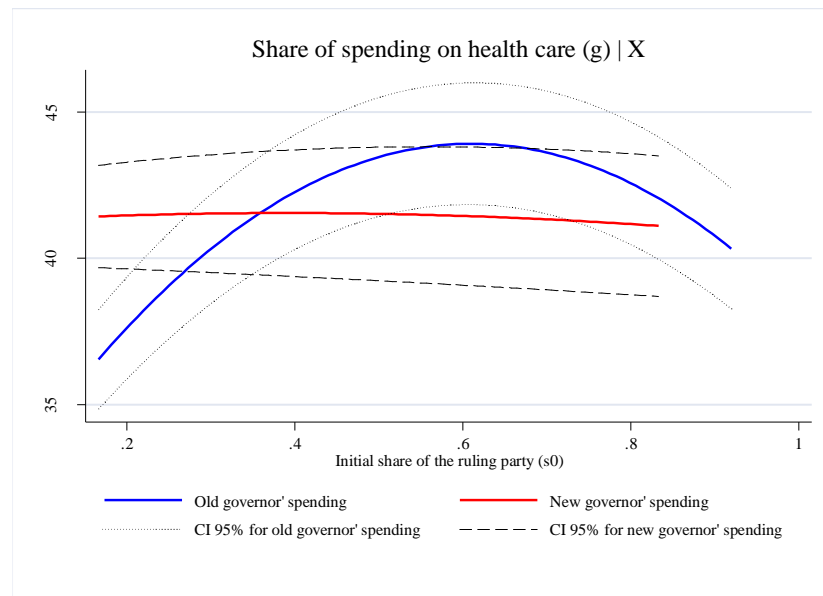


Figure 2. Share of spending on health care in total public spending as a function of the share of the ruling party



Appendix G. Figures of spending on education and health care per capita
with labels of regions and years for observations

Figure 1. Spending on education per capita as a function of the share of the ruling party
(with labels of regions and years for observations)

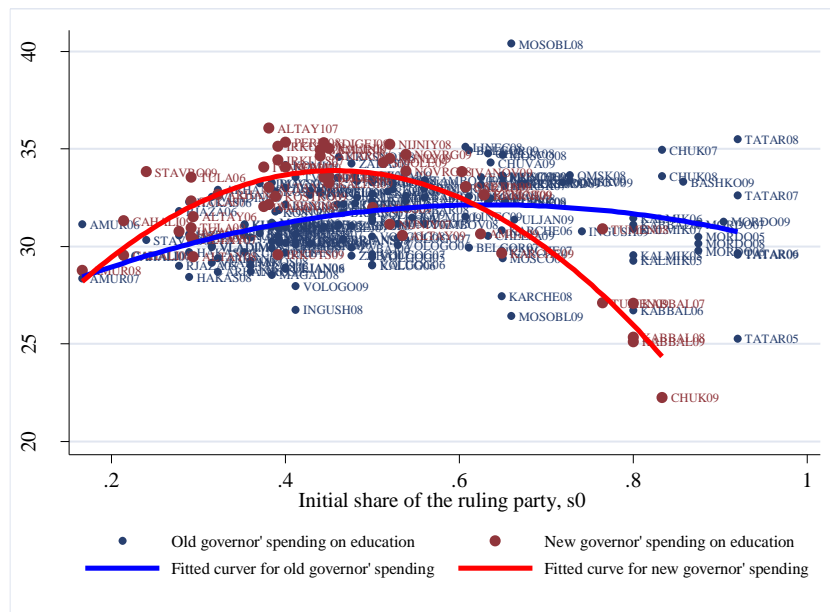
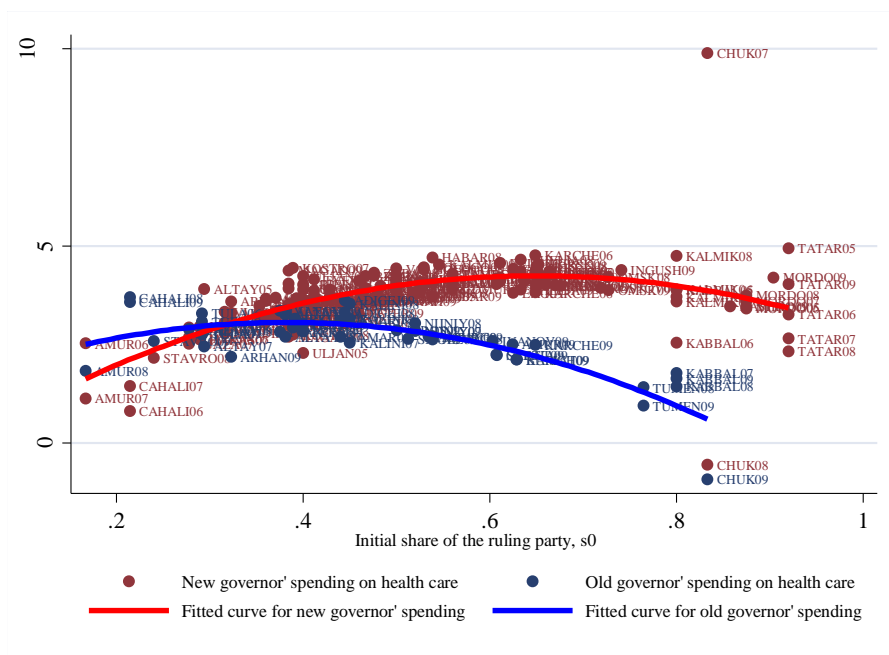


Figure 2. Spending on health care per capita as a function of the share of the ruling party
(with labels of regions and years for observations)



Appendix H. Estimations with 215 observations

(excluded Moscow oblast 2008 and Chukotka 2007)

Table 1. Quadratic specifications for spending on education and health care with 215 observations (for spending on education Moscow oblast 2008 is excluded, while for spending on health care Chukotka 2007 is excluded)

| | spending on education per capita ²⁶ | spending on health care per capita ²⁷ |
|--|--|--|
| | (1) | (2) |
| Dummy for old governor | 25.22*** (9.14) | -0.29 (1.89) |
| Share of the ruling party x Dummy for old governor | 9.45 (18.12) | 15.48*** (3.75) |
| Share of the ruling party x Share of the ruling party x Dummy for old governor | -6.51 (16.74) | -12.75*** (3.46) |
| Dummy for new governor | 19.41* (10.11) | 3.82* (2.09) |
| Share of the ruling party x Dummy for new governor | 48.94*** (16.95) | -0.46 (3.53) |
| Share of the ruling party x Share of the ruling party x Dummy for new governor | -56.28*** (17.64) | 1.14 (3.69) |
| Households income per capita | 1.07 (2.99) | -0.10 (0.62) |
| Regional budget revenues per capita | 0.28 (1.72) | 0.33 (0.36) |
| Share of federal transfers | -15.87*** (3.88) | 1.34* (0.81) |
| Age of governor | -0.01 (0.09) | -0.06*** (0.02) |
| Dummy for businessman | -3.13* (1.63) | 0.08 (0.34) |
| Time keeping office | 0.04 (0.15) | 0.09*** (0.03) |
| Dummy for governor-outsider | -0.74 (0.90) | 0.08 (0.19) |
| Region fixed effect | yes | yes |
| Time fixed effect | yes | yes |
| Number of observations | 215 | 215 |
| R ² : within | 0.65 | 0.38 |

²⁶ No Moscow oblast for 2008

²⁷ No Chukotka for 2007

Appendix I. Estimations with Herfindahl-Hirschman Index as a proxy for intensity of political competition in regional legislatures

Table 1. Quadratic specifications for spending on health care and education with Herfindahl-Hirschman Index as a proxy for intensity of political competition in regional legislatures

| | Spending on education | | Spending on health care | |
|-------------------------------------|------------------------|------------------------------|-------------------------|------------------------------|
| | per capita | as a share of total spending | per capita | as a share of total spending |
| | (1) | (2) | (3) | (4) |
| Dummy for old governor | -176.66 (267.00) | 273.28 (175.90) | -124.24 (116.20) | -313.81 (227.74) |
| HHI x Dummy for old governor | 49.19 (65.77) | -59.39 (43.33) | 29.93 (28.82) | 83.13 (56.10) |
| HHI x HHI x Dummy for old governor | -2.89 (4.03) | 3.72 (2.65) | -1.77 (1.77) | -4.93 (3.44) |
| Dummy for new governor | -870.83*** (316.96) | 220.61 (208.81) | -197.03 (138.89) | 40.01 (270.35) |
| HHI x Dummy for new governor | 224.96*** (78.87) | -45.61 (51.96) | 49.75 (34.56) | -1.03 (67.27) |
| HHI x HHI x Dummy for new governor | -13.97*** (4.88) | 2.81 (3.21) | -3.12 (2.14) | 0.05 (4.16) |
| Households income per capita | -0.46 (3.38) | -4.78** (2.23) | 1.32 (1.48) | -4.59 (2.89) |
| Regional budget revenues per capita | -0.10 (1.92) | -3.29*** (1.26) | -0.41 (0.84) | -4.75*** (1.64) |
| Share of federal transfers | -15.09*** (4.36) | -1.42 (2.87) | -0.90 (1.91) | 3.07 (3.72) |
| Age of governor | -0.03 (0.10) | -0.01 (0.06) | -0.01 (0.04) | -0.09 (0.08) |
| Dummy for businessman | -3.77* (1.94) | 1.33 (1.28) | 0.05 (0.85) | -0.60 (1.66) |
| Time keeping office | 0.09 (0.18) | 0.06 (0.12) | 0.01 (0.08) | 0.23* (0.16) |
| Dummy for governor-outsider | -0.83 (1.02) | 0.69 (0.67) | 1.29*** (0.45) | 0.84 (0.87) |
| Region fixed effect | yes | yes | yes | yes |
| Time fixed effect | yes | yes | yes | yes |
| Number of observations | 216 | 216 | 216 | 216 |
| R ² : within | 0.59 | 0.48 | 0.26 | 0.71 |

Table 2. Linear specifications for spending on health care and education with Herfindahl-Hirschman Index as a proxy for intensity of political competition in regional legislatures

| | Spending on education | | Spending on health care | |
|-------------------------------------|-----------------------|------------------------------|-------------------------|------------------------------|
| | per capita | as a share of total spending | per capita | as a share of total spending |
| | (1) | (2) | (3) | (4) |
| Dummy for old governor | 2.76 (13.63) | 27.19*** (8.69) | -8.57 (5.78) | 16.57 (11.32) |
| HHI x Dummy for old governor | 3.28 (1.55)** | 1.27 (0.99) | 1.17* (0.66) | 2.23* (1.29) |
| Dummy for new governor | 35.17** (15.58) | 37.51 (9.93) | 5.26 (6.61) | 38.29*** (12.95) |
| HHI x Dummy for new governor | -0.93 (1.53) | -0.11 (0.97) | -0.62 (0.65) | -0.35 (1.27) |
| Households income per capita | -1.23 (3.49) | -4.78** (2.22) | 1.21 (1.48) | -4.34 (2.90) |
| Regional budget revenues per capita | 0.08 (1.98) | -3.27*** (1.26) | -0.38 (0.84) | -4.81 (1.65) |
| Share of federal transfers | -14.13*** (4.44) | -2.07*** (2.83) | -0.52 (1.88) | 3.79 (3.69) |
| Age of governor | 0.04 (0.10) | -0.02 (0.06) | -0.004 (0.04) | -0.09 (0.08) |
| Dummy for businessman | -1.35 (1.79) | 1.64 (1.14) | 0.30 (0.76) | -1.86 (1.49) |
| Time keeping office | -0.13 (0.18) | 0.07 (0.11) | -0.03 (0.08) | 0.29* (0.15) |
| Dummy for governor-outsider | 0.04 (1.02) | 0.76 (0.65) | 1.38*** (0.43) | 0.48 (0.85) |
| Region fixed effect | yes | yes | yes | yes |
| Time fixed effect | yes | yes | yes | yes |
| Number of observations | 216 | 216 | 216 | 216 |
| R ² : within | 0.55 | 0.47 | 0.25 | 0.71 |

Table 3. Quadratic specifications for education outputs with Herfindahl-Hirschman Index as a proxy for intensity of political competition in regional legislatures

| | Number of students per class | Number of computers |
|-------------------------------------|------------------------------|---------------------|
| | (1) | (2) |
| Dummy for old governor | 122.81 (153.77) | -4.87 (47.98) |
| HHI x Dummy for old governor | -16.78 (36.58) | 1.42 (11.93) |
| HHI x HHI x Dummy for old governor | 0.67 (2.22) | -0.08 (0.73) |
| Dummy for new governor | 23.26 (262.24) | 79.22 (80.26) |
| HHI x Dummy for new governor | 3.48 (65.05) | -20.03 (20.12) |
| HHI x HHI x Dummy for new governor | -0.28 (4.07) | 1.28 (1.23) |
| Households income per capita | 2.01 (1.80) | -0.53 (0.69) |
| Regional budget revenues per capita | 0.44 (1.87) | 0.60 (0.40) |
| Share of federal transfers | 3.00 (3.31) | 1.08 (1.07) |
| Age of governor | -0.25** (0.10) | 0.01 (0.03) |
| Dummy for businessman | -7.53** (3.00) | 0.43 (0.58) |
| Time keeping office | 0.21** (0.10) | 0.00 (0.06) |
| Dummy for governor-outsider | -1.95* (1.01) | 0.20 (0.26) |
| Region fixed effect | yes | yes |
| Time fixed effect | yes | yes |
| Number of observations | 137 | 127 |
| R ² : within | 0.46 | 0.82 |

Table 4. Linear specifications for education outputs with Herfindahl-Hirschman Index as a proxy for intensity of political competition in regional legislatures

| | Number of students per class | Number of computers |
|-------------------------------------|------------------------------|---------------------|
| | (1) | (2) |
| Dummy for old governor | 76.92*** (13.08) | 1.70 (2.35) |
| HHI x Dummy for old governor | -5.77*** (0.94) | 0.13 (0.28) |
| Dummy for new governor | 39.72*** (10.35) | -4.15 (3.16) |
| HHI x Dummy for new governor | -0.89 (0.62) | 0.90*** (0.32) |
| Households income per capita | 1.91 (1.69) | -0.78 (0.67) |
| Regional budget revenues per capita | 0.46 (1.81) | 0.58 (0.39) |
| Share of federal transfers | 2.75 (3.13) | 1.24 (1.00) |
| Age of governor | -0.23*** (0.09) | -0.01 (0.02) |
| Dummy for businessman | -7.59*** (2.03) | -0.15 (0.39) |
| Time keeping office | 0.20** (0.09) | 0.05 (0.04) |
| Dummy for governor-outsider | -1.86** (0.92) | 0.02 (0.20) |
| Region fixed effect | yes | yes |
| Time fixed effect | yes | yes |
| Number of observations | 137 | 127 |
| R ² : within | 0.46 | 0.81 |

Table 5. Quadratic specifications for health care outputs and outcomes with Herfindahl-Hirschman Index as a proxy for intensity of political competition in regional legislatures

| | Health care outputs | | Health care outcomes | |
|-------------------------------------|------------------------------------|---------------------------------|----------------------|-----------------------|
| | number of inhabitants per a doctor | number of inhabitants per a bed | total mortality rate | infant mortality rate |
| | (1) | (2) | (3) | (4) |
| Dummy for old governor | -1055.09* (617.05) | -814.21 (556.89) | -4.27 (42.47) | -427.63* (217.82) |
| HHI x Dummy for old governor | 332.89** (152.00) | 237.04* (137.18) | 4.35 (10.46) | 109.26** (53.66) |
| HHI x HHI x Dummy for old governor | -20.47** (9.31) | -14.86* (8.40) | -0.27 (0.64) | -6.86** (3.29) |
| Dummy for new governor | -24.83 (732.51) | -523.07 (661.09) | 109.09** (50.41) | -443.90* (258.58) |
| HHI x Dummy for new governor | 78.140 (182.27) | 166.78 (164.50) | -24.08* (12.54) | 113.69* (64.34) |
| HHI x HHI x Dummy for new governor | -4.79 (11.27) | -10.63 (10.17) | 1.51* (0.78) | -7.20* (3.98) |
| Households income per capita | -1.00 (7.82) | 10.91 (7.06) | 0.16 (0.54) | -2.53 (2.76) |
| Regional budget revenues per capita | -7.77** (4.43) | -15.80*** (4.00) | 0.01 (0.31) | -1.62 (1.56) |
| Share of federal transfers | -1.29 (10.07) | -2.03 (9.09) | 0.19 (0.69) | 6.78 (3.55) |
| Age of governor | -0.22 (0.23) | -0.09 (0.20) | 0.01 (0.02) | 0.04 (0.08) |
| Dummy for businessman | 3.62 (4.49) | 1.01 (4.05) | 0.43 (0.31) | 4.00*** (1.58) |
| Time keeping office | 0.19 (0.43) | -0.04 (0.38) | -0.02 (0.03) | -0.24 (0.15) |
| Dummy for governor-outsider | 2.04 (2.36) | -0.41 (2.13) | 0.10 (0.16) | 2.58*** (0.83) |
| Region fixed effect | yes | yes | yes | yes |
| Time fixed effect | yes | yes | yes | yes |
| Number of observations | 216 | 216 | 216 | 216 |
| R ² : within | 0.25 | 0.70 | 0.72 | 0.50 |

Table 6. Linear specifications for health care outputs and outcomes with Herfindahl-Hirschman Index as a proxy for intensity of political competition in regional legislatures

| | Health care outputs | | Health care outcomes | |
|-------------------------------------|------------------------------------|---------------------------------|----------------------|-----------------------|
| | number of inhabitants per a doctor | number of inhabitants per a bed | total mortality rate | infant mortality rate |
| | (1) | (2) | (3) | (4) |
| Dummy for old governor | 311.15*** (31.03) | 170.36*** (27.63) | 15.32*** (2.15) | 24.76** (10.87) |
| HHI x Dummy for old governor | -2.37 (3.54) | -5.57* (3.15) | -0.23 (0.25) | -2.55** (1.24) |
| Dummy for new governor | 291.30*** (35.49) | 169.92*** (31.60) | 11.66*** (2.46) | 24.16* (12.43) |
| HHI x Dummy for new governor | 0.30 (3.48) | -5.37* (3.10) | 0.25 (0.24) | -2.74** (1.22) |
| Households income per capita | -0.30 (7.94) | 10.95 (7.07) | 0.27 (0.55) | -2.66 (2.78) |
| Regional budget revenues per capita | -7.96* (4.51) | -15.83*** (4.02) | -0.02 (0.31) | -1.59 (1.58) |
| Share of federal transfers | 1.88 (10.11) | 0.54 (9.00) | 0.17 (0.70) | 3.88*** (1.43) |
| Age of governor | -0.19 (0.22) | -0.03 (0.20) | 0.002 (0.02) | 0.08 (0.08) |
| Dummy for businessman | -0.51 (4.08) | -0.38 (3.63) | 0.02 (0.28) | 3.88*** (1.43) |
| Time keeping office | 0.34 (0.40) | -0.06 (0.36) | 0.01 (0.03) | -0.30** (0.14) |
| Dummy for governor-outsider | 0.86 (2.32) | -0.75 (2.06) | -0.03 (0.16) | 2.59*** (0.81) |
| Region fixed effect | yes | yes | yes | yes |
| Time fixed effect | yes | yes | yes | yes |
| Number of observations | 216 | 216 | 216 | 216 |
| R ² : within | 0.64 | 0.22 | 0.70 | 0.48 |

Appendix J. Estimations with logarithm of spending as a dependant variable

Table 1. Quadratic and liner specifications for logarithm of spending on health care and education per capita

| | Logarithm of spending on education per capita | | Logarithm of spending on health care per capita | |
|--|---|-------------------|---|--------------------|
| | (1) | (2) | (3) | (4) |
| Dummy for old governor | 2.11*** (0.26) | 2.27*** (0.32) | -0.93 (0.62) | 0.11 (0.74) |
| Share of the ruling party x Dummy for old governor | 0.33*** (0.09) | 0.46 (0.63) | 0.39 (0.23) | 4.27*** (1.46) |
| Share of the ruling party x Share of the ruling party x Dummy for old governor | - | -0.09 (0.58) | - | -3.47*** (1.35) |
| Dummy for new governor | 2.25*** (0.27) | 2.44*** (0.35) | -0.62 (0.65) | 1.15 (0.82) |
| Share of the ruling party x Dummy for new governor | 0.07 (0.10) | -0.02 (0.59) | -0.01 (0.24) | 0.40 (1.38) |
| Share of the ruling party x Share of the ruling party x Dummy for new governor | - | 0.19 (0.61) | - | -0.20 (1.44) |
| Households income per capita | 0.06 (0.10) | 0.06 (0.10) | -0.01 (0.27) | -0.01 (0.27) |
| Regional budget revenues per capita | 0.20*** (0.06) | 0.20*** (0.06) | 0.02 (0.15) | -0.02 (0.15) |
| Share of federal transfers | 0.06 (0.13) | 0.07 (0.13) | 0.36 (0.34) | 0.22 (0.35) |
| Age of governor | -0.003 (0.003) | -0.003 (0.003) | -0.01 (0.01) | -0.01 (0.01) |
| Dummy for businessman | 0.01 (0.05) | 0.02 (0.06) | -0.11 (0.14) | -0.04 (0.15) |
| Time keeping office | 0.01 (0.01) | 0.01 (0.01) | 0.02 (0.01) | 0.02 (0.01) |
| Dummy for governor-outsider | 0.03 (0.03) | 0.03 (0.03) | 0.08 (0.08) | 0.10 (0.08) |
| Region fixed effect | yes | yes | yes | yes |
| Time fixed effect | yes | yes | yes | yes |
| Number of observations | 216 | 216 | 216 | 216 |
| R ² : within | 0.84 | 0.84 | 0.31 | 0.35 |

Appendix K. Linear specifications for spending on education and health care

(with one dummy for new governors)

Table 1. Linear specifications for spending on education and health care with a share of the ruling party as a proxy for intensity of political competition in regional legislatures

| | Spending on education | | Spending on health care | |
|--|-----------------------|------------------------------|-------------------------|------------------------------|
| | per capita | as a share of total spending | per capita | as a share of total spending |
| | (1) | (2) | (3) | (4) |
| Share of the ruling party | 7.49** (3.47) | 5.08** (2.19) | 2.13 (1.48) | 4.34 (2.91) |
| Dummy for new governor | 3.40* (1.49) | 1.24 (1.13) | 1.39* (0.76) | 3.54** (1.50) |
| Share of the ruling party x Dummy for new governor | -10.28*** (3.00) | -4.37** (1.89) | -4.22*** (1.28) | -5.58** (2.52) |
| Households income per capita | 0.96 (3.44) | -5.11** (2.17) | 1.41 (1.46) | -4.01 (2.88) |
| Regional budget revenues per capita | -0.13 (1.98) | -3.45*** (1.24) | -0.45 (0.84) | -4.85*** (1.66) |
| Share of federal transfers | -13.66*** (4.39) | -2.06 (2.77) | 0.36 (1.87) | 4.35 (3.68) |
| Age of governor | 0.01 (0.10) | -0.06 (0.06) | -0.01 (0.04) | -0.11 (0.08) |
| Dummy for businessman | -1.67 (1.77) | 1.55 (1.12) | 0.16 (0.76) | -2.06 (1.49) |
| Time keeping office | 0.08 (0.13) | 0.11 (0.11) | -0.01 (0.07) | 0.31** (0.15) |
| Dummy for governor-outsider | -0.13 (1.01) | 0.74 (0.64) | 1.34*** (0.43) | 0.41 (0.85) |
| Region fixed effect | yes | yes | yes | yes |
| Time fixed effect | yes | yes | yes | yes |
| Number of observations | 216 | 216 | 216 | 216 |
| R ² : within | 0.56 | 0.49 | 0.25 | 0.70 |