Is There a Local Knowledge Advantage in Federations? Evidence from a Natural Experiment

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In economics the local knowledge advantage is probably one of the key arguments in favor of decentralizing the public sector. However, the empirical investigations of this particular effect have been scarce. This paper tests the existence of the local knowledge advantage in a real world setting. Specifically, it looks at the variation of local knowledge across regions based on the origin and careers of regional politicians, assuming that politicians, who have spent a longer period of their life in a particular region, possess better knowledge of that region than outsiders. In order to avoid the endogeneity problem, the paper investigates how local origin affected the performance of the politicians in a natural experiment environment, studying the responses of regional governors in Russia to the disastrous forest fires in 2010. We confirm that local knowledge improves the performance of the governors. However, in a highly centralized federation like Russia, the effect is conditional on the access to federal resources through close ties to the federal center.

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1. Introduction

The importance of *local knowledge* as one of the main advantages of the federal state belongs to the key insights of the theory of federalism. As Hayek (1945: 524) puts it, "if we agree that the economic problem of society is mainly one of rapid adaptation to changes in the particular circumstances of time and place, it would seem to follow that the ultimate decisions must be left to people who are familiar with these circumstances...". Stated otherwise, local governments have a substantial advantage in knowledge of the "circumstances of time and place" and are therefore expected to achieve better economic results in terms of the public policy (Qian and Weingast 1997; Oates 1999; Rodrik 2000; Treisman 2002). Despite the immense importance of this argument, there is almost no empirical research available validating this claim. In fact, it is extremely difficult to devise a reasonable strategy for its empirical investigation. On the one hand, simply by exploring the costs and benefits of federalism in any empirical setting, one is unable to disentangle the "knowledge" benefits from other effects possibly associated with decentralized governance (e.g. inter-jurisdictional competition). On the other hand, it is not easy to measure the knowledge advantage of the regional governments as such. In fact, it is exactly the inability of an outsider (e.g. central government, researcher) to assess local knowledge that makes it so precious. Finally, knowledge is accumulated by individuals and not by "governments". It is therefore possible that bureaucrats on the local level also suffer from significant information disadvantages.

This paper sets out to test for the presence of beneficial local knowledge effects in an empirical setting. For this purpose, instead of looking at the variation of institutions, i.e. of the level of decentralization, and assuming that the latter is associated with the knowledge advantages of the decision-makers, we study the variation of individuals, i.e. decision-makers themselves. It is reasonable to assume that a politician or bureaucrat originating from a particular region has better knowledge of the region than an "outsider", coming from a different jurisdiction. Thus, if local knowledge does indeed provide better outcomes in terms of public policy, territories of a country governed by politicians of "local origin" or those spending a long period of time in the region should perform better than those governed by "outsiders". Hence, it is possible to expect some variation of the local knowledge advantage to be present within a federation across different regions, depending on the biographies of the regional politicians. This is exactly the key element of our research strategy, which looks at the performance of the regional governors in the Russian Federation in the late 2000s.

Russia seems to be an appropriate empirical playground for this analysis. On the one hand, its regions substantially differ in terms of ethnic composition, religions, economic

development, size, topography, climate, natural resources, and geographic location, making local knowledge extremely important for regional policy makers. On the other hand, since 2004 regional governors are appointed by the central government in Moscow. In most federations, where local politicians are elected, it is highly unlikely that complete "outsiders" can win the elections. In Russia it is not unusual that regions are governed by appointees without any past record of experience in that region. In this paper we intend to focus on the local origin of politicians and their tenure duration in the region, which has several advantages. First, this approach is able to disentangle the impact of local knowledge from other aspects of decentralization, because all regions of a particular country are subject to the same rules and institutions. Second, the information on individual biographies of politicians and bureaucrats seems to make the assumption more plausible that they indeed possess substantial "local knowledge", instead of just "assuming" that all individuals working for a local government have per definition superior knowledge of local circumstances.

Clearly, the appointments of regional governors (as well as any other way of selecting regional administrators) can be endogenous to the economic performance of the regions. In fact, a number of recent papers (Zhuravskaya 2010; Reuter and Robertson 2011; Reisinger and Moraski 2011) investigate the role of economic development in the re-appointment decisions of the Russian central government (finding, by the way, that the economic factor plays a minor role as opposed to political loyalty). However, in order to identify the local knowledge effects, this paper uses a natural experiment based on the forest fires in the Russian regions in 2010. In July and August of this year Russia was hit by an unprecedented heat wave with historic record high temperatures, followed by enormous forest fires. The overall economic damage is estimated to have reached 1.5% of the Russian GDP. The regional authorities did play an important role in combating forest fires (not only through their own effort, but also by influencing the allocation of the federal interventions). The fires have been not only unusually strong, but also almost uncorrelated with the forest fires experience of Russian regions in previous years. Thus, it is safe to say that the forest fires of 2010 constituted an exogenous shock which the federal administration could not have taken into account while assigning governors to their territories.[1] Thus, the natural experiment setup should substantially reduce our concerns regarding the endogeneity.

While the natural experiment setting and the intra-national variation of local origin among governors provide us with helpful tools to identify the effect of local knowledge, the Russian Federation still poses an additional problem which we have to resolve. Since Russia

[1] Szakonyi 2011 and Sobolev et al. 2011 use the exogeneity of Russian forest fires to study the changes of political preferences of Russian population.

is a highly centralized federation, the disposable resources of regional crucially depend upon the support of the federal government. The variation of resources caused by often discretionary central interventions is hard to measure and therefore difficult to control for. Under these conditions, it is difficult to disentangle the local knowledge advantage from the effect induced by the various degree of federal support. We deal with that issue by introducing a second important governor-specific characteristic in our analysis. Specifically, we look not only at the level of "local origin", but also at the presence of "federal connections". Close ties to the federal government established during the employment in federal institutions should make it easier for regional governors to get support from the federal administration. Based on the above considerations, three possible outcomes are feasible. First, the local knowledge advantage is so powerful that even the best connected governors perform worse than those with an extensive local background and without any federal connections. Second and contradicting the first outcome, a high level of centralization makes local knowledge useless. The variation in performance is determined solely by federal connections. Third, it is possible that local knowledge determines the within group variation of governors with federal connections. Hence federal connections serve as a "necessary" condition for effective performance, while local knowledge provides the "sufficient" one.

The paper clearly confirms the third outcome. We find that in Russian governors with federal connections perform much better than governors without links to the federal center in terms of combating forest fires in 2010. However, we also find that those of the federally connected governors who have extensive local knowledge of their regions are substantially more effective than their counterparts without local knowledge. Thus, even in a highly centralized federation, local knowledge still seems to matter. The findings are robust to various specifications and control variables.

Our contribution relates to several branches of the literature. First, as mentioned, the explicit investigations into local knowledge in federations have been very limited. Alderman (2002) in an empirical study of poverty alleviation transfers in Albania demonstrates the superior knowledge of local governments by comparing their effectiveness with that of funds allocation based on a detailed questionnaire. In a study closely related to this paper, Persson and Zhuravskaya (2009) investigate the impact of local origin of regional leaders on the performance of Chinese provinces. Although they do not use a natural experiment to identify the possible effects, China is insofar a complementary case as both countries are examples of a heterogeneous federation in which local leaders are de jure only accountable to the central government. Persson and Zhuravskaya do not find any effects for local origin and interpret

their results in line with the literature on the government-business relationship on the regional level and its influence on the performance of regional governments (for the theoretical literature see Prud'homme 1995, Lockwood 2006, for empirical investigations see Goldsmith 1999; Treisman 2000; Fishman and Gatti 2002, 2002a; Reinikka and Svensson 2004; Arikan 2004; Slinko et al. 2005; Gurgur and Shah 2005; Enikolopov and Zhuravskaya 2007; Kessing et al. 2007; Fan et al. 2009) Our case study not only enjoys the advantages of an natural experiment, but also rules out the effects of the state-business linkages as forest fire containment is beneficial for all actor, not merely for politically connected business.

Second, a number of papers look at the impact of close relationships between the regional government and the federal administration on the allocation of federal transfers. Usually these studies investigate whether the regional government is in some sense "represented" at the federal level. Regional representation has been illustrated in cases where the regional governor belongs to the central political decision-making institution; central politicians come from a particular region (Wang 2004); or whether region and federation are ruled by the same political party (Grossman 1994; Levitt and Snyder 1995; Khemani 2004; Sole-Olle and Sorribas-Navarro 2008; Arulampalam et al. 2009). However, the opposite logic, namely the presence of federal connections of a newly appointed outsider in the region has to our knowledge not been explored so far. In the same way, transfers are just one possible way of how the federal administration can "reward" a particular governor and his region.[2] An equally important channel can be direct federal expenditures (although their spatial allocation is usually unknown to the researchers). Moreover, central legislation can be an effective tool. This refers not only to specific laws for a particular region, but also "general laws" which are applicable for the whole federation, but designed with one region in mind. This paper will also contribute to this aspect of discussion, as it will be shown in what follows.

The paper is organized as follows. The next section provides a brief overview of the economic and institutional features of the Russian federalism and describes the construction of our major explanatory variables. The third section tells the story of the Russian forest fires in 2010, explaining the main elements of the natural experiment at hand. The fourth section reports the model and data. The fifth section summarizes the main results. The sixth section reports a number of robustness checks. The seventh section discusses the results, searching for alternative explanations. The last section concludes.

[2] Almost all Russian governors are male; hence the use of the particular pronoun.

2. Russian federalism and regional governors

2.1. The road to centralization

Although already in the 1990s the Russian federalism was based on a high level of de jure centralization, the country witnessed a strong de facto "devolution from below" with regions unilaterally "grabbing" authorities and bilaterally negotiating concessions with the central government (see Obydenkova 2008 for a survey). While concerned about preventing regional secession and deep economic crisis, the Yeltsin administration had only limited opportunities to intervene in the development of the regional political systems (Gel'man 1999). In the early 1990s president Yeltsin still relied on gubernatorial appointments, with the exceptions of the ethnic republics which were granted the privilege of gubernatorial elections as early as 1991.[3] While in late 1992 the federal administration issued a moratorium on regional elections, which was nevertheless partly ignored by some regions (e.g. Tyva), since 1996 elections were established as the only tool of selecting regional governors.

The election of Vladimir Putin as new Russian president in March 2000 marked a turning point in the intergovernmental relations between the federal center and its regional periphery. Almost immediately after his accession to power, Putin initiated the first wave of far-reaching federalism reforms, aiming to increase the authority of the federal center and restricting the autonomy of regional governors. First, a number of changes were conducted in areas of fiscal federalism, which increased the share of regional revenues attributed to the federal budget (Idrisova and Freinkman 2010, Chapter 3). Second, the Putin administration replaced the heads of regional branches of federal agencies by bureaucrats without close ties to the regional administration. Third, regional governors were deprived from their right to sit in the Federation Council[4] and were put under the supervision of plenipotentiary representatives of the president. Forth, the federal center increased the control of regional political processes. A number of other reforms were implemented throughout 2003-2006, significantly centralizing the decision-making in Russia (Ross 2010).

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[3] Russia traditionally includes a number of regions designated "republics", which originally had a higher level of autonomy, but under current Constitution of 1993 have the same rights as other regions. The heads of many ethnic republics have (until 2011) been called "presidents"; other regions use the term "governor" or (in case of the City of Moscow "mayor"). We refer to "governors" as all heads of regional administrations in Russia, and use the term "president" merely to describe the president of the Russian Federation.

[4] Russia's legislative body, the Federal Assembly, is subdivided into the Federal Council (higher house) and the State Duma (parliament; lower house). The members of the State Duma are elected. Until 2000 the senators of the Federation Council were made up of two *ex officio* representatives from each region: the heads of the regional executive and legislative branches (governor and president of the regional parliament respectively). The reforms allowed senators to hold only one political office and determined that one senator has to be elected by the regional parliament, while the second has to be nominated by the governor, however needs to be confirmed the legislative body of the region.

There is no doubt that the greatest interference into the governors` autonomy was the president's decision in December 2004 to replace regional gubernatorial elections by presidential appointments. Although the previous trend of centralization had hardly gone unnoticed, the specific decision was unlikely to be anticipated by the governors as it was primarily "provoked" by the terrorist attack of Beslan in 2004. The introduced appointment routine de-jure stipulates the Russian president to recommend a potential candidate for governor to the regional legislative assembly. The members of the regional parliament have to accept or reject the candidate by majority vote. In the case of a triple rejection the president can disband the regional legislative and call for new elections. Furthermore, the president has the right to dismiss the regional governors on basis of a "loss of confidence" (though this opportunity was used only three times throughout 2005-2011). However, de-facto, the federal administration unequivocally appoints the governors and no regional parliament has so far rejected a president's preferred candidate. Initially the central administration was overcautious with its appointment decision, often keeping old powerful governors in their office (Chebankova 2005). However, by the end of end of 2000s most of the long-lasting governors had been replaced (e.g. governors who served for nearly two decades such as Rakhimov in Bashkortostan, Luzhkov in Moscow or Shaimiev in Tatarstan).

2.2. The origin of governors

Therefore modern Russia represents an interesting case where a highly heterogeneous country is ruled primarily by governors appointed from the federal center. In the past governors had to run challenging election campaigns and thereby not only accumulated knowledge about the region, but also acquired connections in the region (although, of course, not all governors of that period were elected based on the regional origin either). Currently Russian governors often come from territories thousands of kilometers away from the region they have to rule. These politicians not only missed out the experience of an election campaign, but more fundamentally have never lived in their region of office before. To provide a recent example, Aleksei Gordeev, governor of Voronezh region since 2009, was born in Frankfurt-an-der-Oder (German Democratic Republic), spent his childhood in Magadan about 12,000 kilometers away from Voronezh,[5] studied in Moscow ("only" about 600 kilometers away) and continued his political career in the Moscow region and afterwards in the federal ministry of agriculture. The appointment was probably motivated by the significant share of agriculture in the economy of Voronezh. On the other hand, other regions

[5] Shortest travel distance, as reported by Abramov (2008)

are governed by politicians that never left their territory and after 2004 became re-appointed by the federal center. Overall, there is a significant variation of the governors of Russian regions in terms of their "local origin", which we are going to explore in this paper.

In order to capture this variation of local origin, we screened the (publicly available) biographies of all Russian regional governors. The biographical data has been extracted from a number of public sources such as websites of the regional administration and governor's individual websites. As a result we set up a local origin index which measures the relative period a governor has spend in his region of office before inauguration by looking at three key biographical cornerstones. We are interested in the governors` region(s) of birth (and subsequent adolescence), education, and career stages. Each of the three periods provides access to specific knowledge about regional characteristics and local networks. Based on the chronological information we determine the governor's duration of residency in his region of office and calculate the age at taking office. The ratio of the length of stay and inauguration age yields the degree of local origin. Reoccurring pattern in the biographical data allowed us to set up a discrete index for the local origin between 4 and 1, of which 4 is the highest possible level of the "local origin".

Governors with a score of 4 spend between 70% and 100% of their "pre-inauguration life" in their region of office and therefore have a strong regional identity (on average 89% for local origin level 4). In order to fall in this category a governor with the average inauguration age of 53 years should have spent a maximum of 12 years outside his region. If one assumes a 5 years leave in order to study in a distant university (e.g. in Moscow as many governors did) this leaves only room for a maximum 7 years period outside the region (much less for younger governors).[6] In contrast, a governors evaluated with score of 3 spent a long period of his life in another region. In quantitative terms this means, that the governor spent between 20% and 70% of his life in the regions in which he assumed office (on average 44% for local origin 3). Governors with a local origin score of 2 and of 1 were born educated and worked in a different region and moved only recently before their inauguration to their region of office. The share of their life the spent in the region of office falls between 0% and 20% (on average 3% for local origin 1 and 2). Despite the short period of residence we distinguish between two separate levels of local origin. The governors who have worked for the majority of their life in a "close-by" region are assigned with local origin 2, while governors who were appointed to "far-away" region receive a score of 1. We measure the proximity in the following way: a close region falls with the same federal district, while a distant region is located in another

[6] For a much more detailed account on the calculation of the local origin index see *Appendix A*.

federal district.[7] In the following empirical analysis we will also look at governors` age and tenure (as of 2010), in order to control for competing sources of local knowledge.

In order to illustrate the different degrees of the local origin index we will provide four explanatory examples. The former mayor of Moscow City, Yuri Luzhkov (1992-2010) was born raised and educated in Moscow. After graduating from the State University of Oil and Gas in Moscow he commenced his professional career in the chemical industry, as well as his political career in the administration of Moscow city until he eventually became mayor in 1992. Thus, this governor unambiguously received the highest possible score equal to 4. The current governor of the Smolensk region, Sergey Antufyev, was born in Kazakhstan and studied at the Kazan State Technical University in the Tatarstan region. After his graduation he moved to Smolensk where he commenced his professional and political career in the city administration before he was appointed governor of Smolensk in 2007. In this case the governor's local origin score is 3. The current governor of the Ivanovo region, Michael Men, was born in the Moscow region and studied at the State University of Oil and Gas in Moscow. After graduation he pursued his professional and political career in the administrations of Moscow region and Moscow where he eventually reached the position of vice-mayor in 2002. However, in 2005 he was appointed governor of Ivanovo region. Since Ivanovo is geographically not very far away from Moscow and correspondingly falls within the Central federal district Men's score accounts to 2. Finally, the current governor of Kamchatka region, Aleksey Kuzminzkiy was born in Kemerovo Oblast (Siberian Federal District) studied in St. Petersburg (Northern Federal District) and worked in Moscow (Central Federal District). In 2005 he was appointed vice-governor and in 2007 governor of the Kamchatka region (Far Eastern Federal District). Since in this case the governor's place of origin and work was geographically extremely distant from the region to which he was appointed he falls within the local origin 1 sub-group.

Clearly, the way in which the local origin index was constructed was partly arbitrarily. Particularly, the difference between 1 and 2 may be superficial. The borders of federal districts do not necessarily represent an "excellent" division of the Russian territory in any way. Moreover regions within federal districts can be very heterogeneous and may be located far away from each other (e.g. Siberia or Far East). In the same way, the difference between 3

[7] Federal districts are groups of geographically close regions, which have been established by Vladimir Putin in 2000. Currently several federal agencies have their territorial organization in Russia based on these districts. The presidential representatives in the districts have the function of (at least, informal) oversight over governors and are involved in the appointment decisions. For our purpose, however, districts just form convenient units of separation of "close" and "distant" regions in Russia – given the size of the country, the differences between the "distant" ones are often enormous.

and 4 is in some cases in flux. Therefore, we have to check for the robustness of our findings. For this purpose, we have also constructed an alternative binary variable, which is equal to 1 for all governors, who spent most of their previous career in the region which they were appointed to (i.e. with score 4 and 3) and 0 for all other governors. Now there is much less uncertainty in terms of how the governors are allocated. Governors with regional experience are assigned a 1, while those with no regional experience receive a 0. Of course, for this variable we may under-estimate the regional knowledge: consider, for instance, a governor who spent his entire life in a neighboring region, yet is treated according to our approach as identical to the governor, who comes from a very distant region. Therefore, we will use both variables to validate our results. As we will show, however, the findings are exactly identical in both cases (although somewhat stronger for the binary variable). Hence, the results of this paper can be treated as highly robust.

The pre-appointment biography of the governors covers only one potential aspect of the local knowledge. Therefore we also looked at the governors` tenure of office. The exact moment of power (authority) transfer cannot be determined consistently for all governors. First of all, there is a variation of how governors are selected over time. Many of the long-lasting governors which came into power before 1997 have been appointed by President Yeltsin. In the subsequent period, until 2004, governors were elected by the regional population. After 2004 governors were appointed again. Moreover there is a small intraregional variation in the appointment routine of governors. For example, after 2005 the official appointment process has three administrative stages. First, the president proposes a candidate to the regional parliament.[8] Second, the regional parliament approves the candidate as governor by election. Finally, there is an official inauguration ceremony in which the new governor formally assumes the office (the ceremony can take place one or two months after the election victory or acceptance by the regional parliament). The sequencing of the three stages differs. Sometimes all three stages may happen within one day, while in other cases the regional administration abstains from an official inauguration ceremony at all. In order to deal with both sources of variation and to stay consistent for all governor we consider the start of a governor's tenure at the date of the appointment decree (for governors who have been appointed by Yeltsin), the date of election victory (for elected governors until 2004), as well as the date of the official acceptance of the president's candidate by the regional parliament (for governors appointed by Putin or Medvedev).

[8] In case the incumbent governor voluntarily retreats the president will appoint an interim governor until he offers a suitable candidate to the regional parliament. In many cases the interim governor turns out to be the president's man.

An additional complexity results from the fact that in many regions the election and inauguration of the regional governor takes place at the end of the year (and sometimes the events fall in two successive years). In other regions governors are replaced in summer or in spring. In order to increase precision we look at *days* in office, starting from date of appointment (as defined above) until July 2010 the beginning of the wildfires. While there have been restrictions on the duration of appointment introduced by the Russian government and regional constitutions at different points of time, they have also often been changed and disregarded for individual leaders, therefore the variation of tenure of Russian governors is significant. As mentioned, some of them spent almost two decades as heads of their regions, while others lasted less than two years. Interestingly enough, as we will show in what follows, the effect of tenure is negligible as opposed to the effect of the local origin variable. Hence, "learning by doing" in case of governors appears to be not really important.

2.3. Federal connections of regional governors

The logic of appointments of regional governors in Russia remains not entirely clear. Officially, the federal president acts on recommendation of his representative in the federal district and, since 2009, of the majority party in the regional legislative assembly. However, in almost all Russian regions the majority is in the hands of Edinaya Rossiya (United Russia), the pro-Kremlin party often rather reflecting the "recommendations" from the presidential administration than speaking with its own voice. The factors taken into account as part of the appointment decisions seem to be numerous. They include, for example, political loyalty of the governors, population of the region, ethnic heterogeneity and balance between various ethnic groups (which the federal government does not want to upset), influence of regional and federal interest groups etc. Hence, even if the old governors were replaced by the new appointees, the level of access of the latter to the federal administration differs substantially. In some cases governors keep close ties to the federal bureaucrats and can expect the latter to provide the support necessary to the region. In other setups regional governors have only limited access to the federal center.

The federal support, however, plays an important role in the development of Russian regional policies. To start with, one of the key consequences of the Putin's reforms (which remained in power under Medvedev) was the re-allocation of financial resources at the federal level. Russian tax system has been centralized from the beginning: the list of taxes, tax rates and tax bases are mostly set by the federal government (for many split taxes regions receive a fraction of tax revenue), with some exceptions. In the 2000s the share of taxes attributed to

the regional budget was constantly diminishing. Furthermore, most Russian regions receive large financial support from the federal center necessary to maintain their functions. The support is partly distributed through a formula-based fiscal equalization mechanism, but in many cases the federal government has substantial discretion in the allocation of funds. Finally, the direct federal expenditure also play a large role (particularly in the second half of the 2000s, when, as the consequence of the oil boom, the Russian government started a number of ambitious projects), and their allocation can also be influenced by the pork-barrel politics. Overall, having access to the federal decision-makers is a crucial factor of success for the Russian governors, which one definitively has to take into account.

Measuring the "federal connections" of the regional governors is an extremely difficult task. The politics in Russia is intransparent, so we have only limited information about the actual structure of alliances in the federal and regional bureaucracy. While the media and the academic studies are full with references to "clans" and "networks" in the Russian elite (e.g. Wedel 2003), they rarely provide convincing empirical data for the investigation. Party membership, which has been actively used in the literature, is not applicable to Russia. Almost all Russian governors are either members or supporters of Edinaya Rossiya. Hence, in this paper we used a different approach. In order to capture federal connections we create a dummy equal to 1 for all governors, who have in the past worked in the federal administration. Specifically, we consider the experience since 2000, i.e. when Putin came to power: working in the federal administration under Yeltsin does not necessarily ensure the connections in the Putin and Medvedev era (certainly, not in the late 2000s, which we are investigating). The idea behind our approach is straightforward. Having worked for the federal bureaucracy, the governors most likely keep some sort of ties and connections to the federal administration, and can use these ties to receive larger resources for their region. Typically, the governors with federal connections have worked in ministries, the administration of the president (an institution providing direct support to the president) and as plenipotentiaries of the president.[9] The positions as members of the parliament do not count as federal connections, since in this case the links to the federal bureaucrats (who are actually in charge of distributing resources) are not necessarily present (the Russian parliament is essentially powerless and accepts almost all suggestions of the executive without further debate).

[9] The latter group is officially part of the presidential administration. Notice that Russia is a dual federation: all federal agencies operate in the regions through their own branches rather than by delegating authorities to the regional governments. We count the positions in regional branches of federal agencies as "federal connections" as well.

Since the introduction of gubernatorial appointments the federal government increasingly appointed bureaucrats with federal connections to regional governors. While in 2007 only 6 governors had close ties to federal institutions, by 2010 already 17 regions were headed by politicians with connections to Moscow. By 2011 almost every newly appointed governor has federal connections. Let us at this stage also provide two examples of the governors with federal connections according to the logic of this paper. The head of the Altai Krai, Alexander Karlin, was appointed governor in 2005, having worked in the ministry of justice (2000-2004) and the administration of the president (2004-2005) before. In 2002 he was appointed first deputy minister of justice, i.e. the highest rank below the position of the minister himself. The governor of Orel region since 2009, Alexander Kozlov, worked as a deputy head of the presidential administration (1999-2004) and deputy minister of agriculture (2004-2009).

It is important to point out that the correlation between the local origin and the absence of federal connections is far from being perfect. There are cases of governors with substantial federal connections and local origin. For example, the current head of Bashkortostan, Rustem Khamitov, spent the longest period of his life in Bashkortostan,[10] after which he left the region for 8 years, working in the federal tax agency and the federal water resource agency, before returning as governor to Bashkortostan in 2010. There are also cases of recently appointed governors, who have neither local origin nor federal connections. Vyacheslav Nagovitsin, currently head of Buryatia, spent his entire career in Tomsk, where he worked in the regional administration (since 1999 as vice-governor) before moving to Buryatia. Thus, federal connections and regional origin constitute two possible dimensions of the governor's career, which could affect his effectiveness as the head of the region.

Generally speaking, the effect of both variables could be ambiguous. Federal connections could improve the performance of the governor due to the better access to the federal administration. However, they could also let the governor consider his appointment a merely short-term assignment, thus reducing the effort (especially because in Russia there is no system of promotion based on regional economic performance similar to that in China; Libman et al. 2011 investigate this problem in greater detail). In the same way, local origin can be associated with local knowledge, but it can also make the governors more susceptible to the capture by regional interest groups. If the advantage of the local knowledge is present, we expect the governors with local origin to perform better than their counterparts. However,

[10] Rustem Khamitov was born in Kemerovo region (Siberia). However, as a child moved to Bashkortostan (Volga). In addition, he left the region for Moscow City in the 1970s were he graduated from prestigious state technical university (Bauman).

given the centralized nature of the Russian Federation, we expect this effect to be conditional on the presence of federal connections as well.

3. Russia's forest fire in 2010

Obviously, the appointment of the governors and the duration of their tenure in the regions can be endogenous to the performance of the regional economies. It is reasonable to claim that the origin of the governor is an issue the federal government does take into account while deciding upon a possible appointment (as it has already been done in the Soviet Union, see Konovalov 2004, 2006). On the one hand, the central government could be willing to appoint leaders with strong regional background exactly to let the benefits of "local knowledge" support the economic development of the region. On the other hand, the federal administration could be interested in breaking the connections between the regional governments and regional elites, or in getting access to attractive assets in the regions. Furthermore, in spite of the obvious dominance of the center, it is not omnipotent at least for some regions and partly has to take regional interest groups into account. Overall, there seems to be a clear case of reverse causality in any examination of impact of "local origin" on the regional economic performance. Therefore a reasonable strategy we have chosen was to investigate a case of unpredicted and strong exogenous shocks. It is also, as mentioned, consistent with theoretical argument at the core of the "local knowledge" debate.

This paper uses the Russian forest fires of 2010 as the natural experiment revealing the advantages of the local knowledge the governors have. The idea that a natural phenomenon (like forest fires) can be used as a source of exogenous variation seems to be self-evident. Nevertheless, in order to present a convincing case, we still have to clarify several issues. First, the impact of the forest fires on the national economy should be substantial enough to consider this issue as a relevant topic for the regional governors (otherwise the variation in outcomes could be simply determined by the "lack of attention", which would mean a lot of noise in our data). Second, it is necessary to show that the allocation of forest fires was indeed random and, what is more important, uncorrelated with the past experience of the forest fires in Russia. Even if it not the case, still if the magnitude of forest fires was much larger than usually, one could treat the wildfires as a natural experiment (assuming that nobody anticipated the scope of the effect), but our argument were substantially weaker. Third, we have to demonstrate that the decisions made by regional governors actually mattered in terms of wildfire protection in Russia. In what follows we will systematically investigate all these three issues and provide convincing evidence that, first, damage from wildfires was very

large, second, they were unpredictable and uncorrelated with the wildfires in the past, and third, the governors' role in the fire prevention is large.

3.1. Temperature anomalies

The forest fires were preceded and caused by enormously high temperature, which was at a century high exceeding that reported for any preceding period of observations.[11] The magnitude of the wildfires was primarily caused by an incomparable heat wave with record high temperatures.[12] The extreme temperature anomalies were not a phenomenon restricted to the territory of the Russian Federation, but was observed in many countries of the Northern Hemisphere (although Russia was hit particularly hard).[13] Already in the month preceding the wildfires, particularly in May and June, temperatures exceeded long-term averages by several degrees Celsius.[14] In mid July a weather station in the Southern European part of Russia (Kalmykia region) measured 44 degrees (111.2°F),[15] the highest temperature ever recorded on Russian soil and breaking the previous record of 1940. In the Far East (Amur region), thermometers showed 42.4 degrees, the highest ever recorded temperature in the Asian part of Russia. The heat wave was particular severe for people living in large cities such as Moscow, Volgograd, or Rostov which also recorded temperatures around 40 degrees.

However, the heat wave did not hit every region with the same severity. *Figure 1* vividly illustrates the land surface temperature anomalies for the end of July 2010 (average for 20.-27. July) compared with the average temperatures for the same period between 2000 and 2008. Especially regions in the Ural and Siberian districts (white and blue shaded areas) were not only largely spared from record high temperatures, but in fact experienced below-average temperatures. Other areas, especially Eastern Siberia, the Central and Southern Federal Districts (red and orange shaded areas) measured temperature anomalies of up to 12 degrees above average for the respective period. The heat wave started in the Far Eastern and partly in the Siberian regions which first recorded temperatures up to 40 degrees in late June 2010. In July the high temperatures moved westwards to the Ural regions and by mid July "arrived" in the European part of Russia. Not surprisingly this pattern of spatial expansion corresponds to the proceeding emergence of wildfires. As illustrated in *Appendix B* the first

[11] According to the claim of the head of the Russian weather monitoring agency Rosgidromet, it is possible to claim that the temperature of the summer 2010 constituted a record even as compared to the last 1000 years (see RIA Novosti, 2010, August 9)
[12] See the weather blog of Jeff Masters on temperature anomalies in Russia (wunderground.com, 19. July 2010).
[13] The period of April-June was the warmest ever recorded with 1.25 degrees above average
[14] While temperatures in May already exceeded average values, by mid June measured temperatures already exceeded 35 degrees. On average temperatures do not rise above the level of 30 degrees in June.
[15] Throughout the paper temperatures will be specified in degrees Celsius

severe wildfires were recorded in the Far Eastern and Siberian federal districts in the end of July.

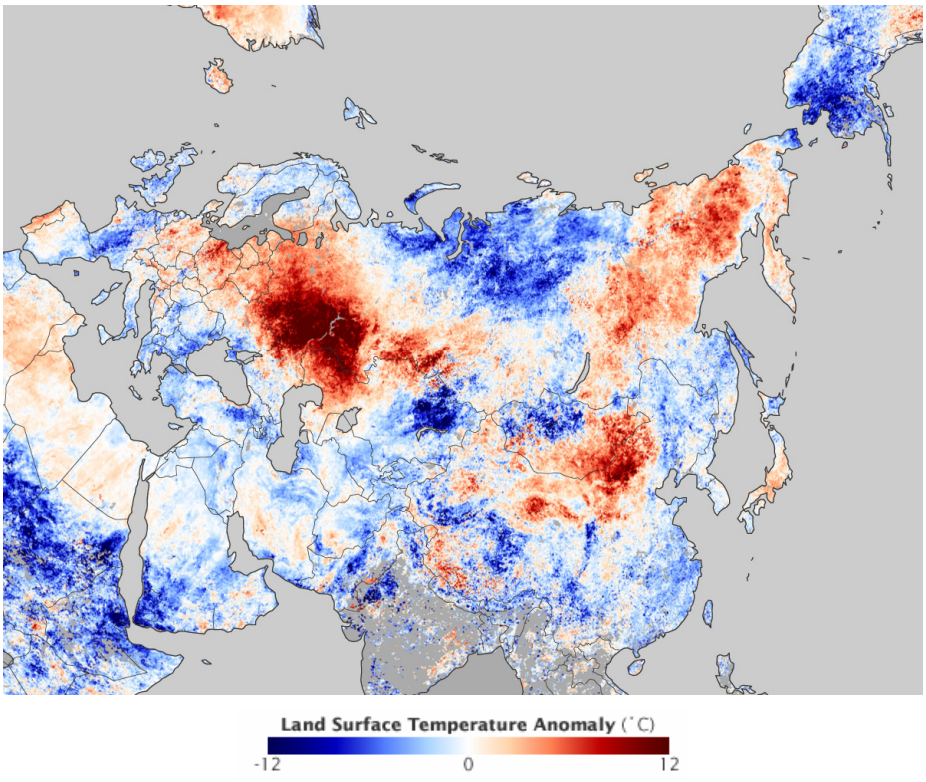


Figure 1: Land surface temperature anomalies for July 20-27. 2010 compared with the temperatures for the same dates from 2000-2008

Source: NASA Earth Observatory (http://earthobservatory.nasa.gov)

3.2. Forest fires

Although forest fires of course happened in Russia before, the destructive effects in 2010 were significantly larger than usually. Overall the forest fires in 2010 have been regarded one of the most devastating ever recorded. The period of permanent wildfires lasted from the end of July until the beginning of September 2010. According to official data by the Russian Statistical Agency Rosstat in 2010 the amount of burned trees has increased by over three times in comparison to the average (although the number of forest fires reported increased only by approximately 23 percent). Wildfires affected 2,026,873 ha of forest area all over the country (versus 1,404,732 ha on average in 2000-2009). As a result of the forest fires and heat, Russian economy suffered under significant damage, which, according to some estimates, reached the level of 20 bln USD including material damage, human losses (calculation based on statistical life value) and output decrease due to productivity losses as a result of temporary suspension of production in several industries, reduced working hours and

drought (Boris Porfiriev, personal communication).[16] As of August 6, more than 100 villages were completely or partially destroyed by fires. The air pollution due to forest fires caused a substantial number of excessive deaths in large cities[17] and forced a number of companies and agencies (including many foreign embassies) to stop their current operations in Moscow.

Furthermore, the forest fires indeed followed a path difficult to predict based on previous observations. The actual destructiveness of the forest fires among regions in terms of burned trees in 2010 is not at all correlated with the previous years: the correlation coefficient between the indicator of 2010 and of 2000-2009 is equal to minus 0.0297, i.e. the allocation was almost random as opposed to the past experience. The situation is hardly surprising, of one recalls that the forest fires followed the heat wave, which was in turn uncorrelated with the past experience. However, one does find a significant correlation of the number of forest fires reported in 2010 correlate with the average number of forest fires in the last 9 years ($r = 0.58$). This is an important element we are going to use in our identification strategy; the number of forest fires reflects the instances when the wildfires were *identified* and *reported* by respective authorities. As we have already pointed out, the area covered by forest fires increased by roughly two times as opposed to the average in the previous decade; but in some regions the increase was much larger (in the Central and Volga federal districts the area covered by forest fires went up by 42 and 51 times respectively).

Furthermore, the entire natural disaster took about 2 month into account (July and August), which is also traditionally the vacation period for Russians, including bureaucrats. While several governors and federal bureaucrats decided to interrupt their vacation and to return to their regions to combat fires (others did not, what became an issue of substantial political controversy), it was still technically impossible for the federal administration to replace governors reacting on their performance already in summer 2010. Thus, the reverse causality can be excluded. In the same way, given the unpredictable nature of the heat wave movement over Russia, we have no reasons to expect it to be correlated with other (unobservable) characteristics determining gubernatorial appointments: hence, omitted variable bias is also unlikely.

[16] For example, the draught destroyed about 20% of the country's wheat crop (Hernandez et al. 2010), forcing the government to impose export restrictions on grain.

[17] For example, in July 2010 the mortality rates in the city of Moscow increased by 50.7%, in Vladimir region by 18.4%, in Ivanovo region by 18.3%, in Moscow and Tula regions by 17.3%. In August some reports indicate an increase of mortality from the average 360-380 people per day to 700 people per day. The overall excessive death from the heat and wildfires is estimated at the level of 55,800 people in June and August 2010.

3.3. Forest administration

It remains to clarify which role the regional governors played in combating the forest fires (see also Blokov 2010). Until 2007, the vast Russian forest territory was managed centrally by the Federal Forestry Agency (*Rosleskhoz*), a subdivision of the Ministry of Natural Resources.[18] Its responsibility included forest administration, utilization of forest resources and forest protection.[19] In densely populated areas the agency operated local branches (*Leskhoz*), while in inaccessible areas it relied on forest plane brigades (*Avialesoochrana*). Although fire fighting aircrafts were often organized in small and economically unviable units, they have proven to be the most effective mean of forest fire extinction. In general, any forest-related activity in Russia is regulated by the Forest Code (*Lesnoy kodeks*).[20] The latest version of the forest legislation, which became effective in 2007, marked a drastic turning point. In order to turn the forest industry into a profitable and competitive business the federal center transferred the forestry authority to the regional level.[21] The reforms had a number of consequences for regional administrations (see Bayandina and Kamenev 2011). First, the regions were responsible to formulate their own forest policy and implement corresponding measures for forest fire prevention and extinction. Consequently, the local branches of the Federal Forestry Agency were taken over by the regional administrations. In a similar fashion federal fire plane brigades were liquidated and planes and machinery allocated to the regions.[22] The decentralization of authority created a highly fragmented forestry administration among Russian regions with little coordination across administrational boundaries. Second, the restructuring resulted in the reduction of forest rangers and related personnel thereby limiting the effectiveness of forest administration and forest fire detection. Finally, regional forest administration and forest fire fighting became depended from fiscal transfers from the federal budget. Although the federal Ministry of Emergencies did intervene in 2010 due to the catastrophic scope of the fires, yet only after

[18] With its approximately 7.8 million km^2 Russia has the largest forest area in the world. In fact, 45.4% of Russia's soil is covered by forest. Before 2000 the Federal Forest Agency was an independent organization without administrative bonds to any ministry. The responsibility of the Ministry of Natural Resources encompasses mining activities, water resources, forestry, and environmental issues.

[19] In administrative terms the Russian forest is divided into forest territory that belongs to the forest fund and other forests. The former includes the territory which is covered by forest (99.5%), excluding the forests which belong to the Russian military and municipalities (0.5%; by 2005). The Federal forestry agency is only responsible for the forest funds. Any forest data presented in this paper is related to the forest fond.

[20] The first forest law in the post-Soviet period became affective in 1993 (Principles of the Forestry Legislation of the Russian Federation). The code was exposed to several reforms, including a complete revision in 1997.

[21] One of the major goals of the latest revision of the forest code was to attract investments to the forest infrastructure and promoting long-term lease agreements.

[22] Although the Federal Forest Service continued to exist it was left over with very little authority in the administration of forest

they have reached the disastrous proportions; the role of regions thus remains crucial in this area.

4. Model and data

Our aim is to understand to which extent the variation of local origin and federal connections of Russian governors influenced the effectiveness of their regional administration to monitor and extinguish forest fires. For this purpose we need a dependent variable that measures the magnitude of regional wildfires. The Rosstat annually reports two regional forest fire figures which appear to be suitable for this purpose: first, the total number of forest fires on the basis of discovered fire sources; and second, the forest area covered by fire measured in hectares. Simply using the former figure as measure of effectiveness seems to be problematic. On the one hand, a high number of reported wildfire incidents can be interpreted as inability of the regional administration to deal with the natural disaster. On the other hand, it may indicate a high degree of monitoring effectiveness. This measure ignores a decisive factor for the success or defeat of forest fire fighting, namely the point in time at which the fire is monitored and extinguished. The chances to contain a wildfire are the highest in the early stages of fire expansion. Thus, a region that reports a large number of wildfires could have a very effective forest agency (spotting fires and containing them very early, in spite of adverse temperature conditions), but also a very bad one (where multiple fires are allowed to spread). As already mentioned, the correlation between the number of forest fires reported in 2000-2009 and 2010 is higher than for the damage from forest fires, suggesting that the first variable is rather influenced by the quality of monitoring.

Thus, to capture this monitoring effectiveness our main dependent variable is going to be the *ratio of forest area covered by fire to the number of reported forest fires.* If the indicator is low, it means that even multiple forest fires were contained very early and did not spread. If the indicator is high, however, the situation is the opposite. Even very few forest fires spread across the region with disastrous effect for its forests. Any covariate which improves effectiveness of forest fire monitoring will therefore reduce the average forest fire coverage per fire and ultimately decrease the dependent variable. Hence, variables increasing effectiveness should have a *negative* coefficient in our regressions using this dependent variable.

There are a number of region-specific covariates which may have an effect on the probability of wildfires emergence and the possibility of forest rangers to detect and contain them and thus should be controlled for. First of all, we consider the size of the territory of the

region. Since Russia's regions are characterized by some large outliers in terms of territory we use the natural log of the regional area.[23] Moreover, we look at the share of regional territory covered by forest, as well as the long-term average temperature and rainfall in July. Large regions with high temperatures should increase the probability of forest fires, whereas small regions with frequent rainfalls should have the opposite effect. In addition, we control for forestry expenditures from the regional budget.[24] Finally, we account for the human factor, which is considered by far the most common cause of forest fires by controlling for the urban population of the region. People may have an ambiguous effect on forest fires. On the one hand, the highest risk of wildfires is usually observed in densely populated urban areas. For examples, during weekends people escape their crowded cities for recreation in the surrounding countryside. In general, city dwellers are also less accustomed to responsible behavior in forests. Wildfires in close proximity to urban areas are considered to be most severe as they directly pose a threat to human health, as well as social and economic order. On the other hand, forest fires which occur close to urban areas are more likely to be detected and extinguished at an early stage of expansion. Large cities are also less threatened by the destruction than small villages and have larger resources to be used. To account for the human influence, we include the total number of the regional urban population into all of our specifications. Specifically, we use the natural log of the urban population, since some regions are considered to be outliers in terms urban population.

Hence, we regress the indicator of effectiveness of the governments in combating forest fires on these region-specific controls, as well as two characteristics of the governors: local origin and federal connections. In a number of specifications, we also interact local origin and federal connections, to see whether governors possessing *both* characteristics at the same time behave significantly different than the rest of the sample. There is a further interaction effect we take into account. The enormous scope of the forest fires in Russia of course attracted the attention of the federal government and, specifically, of the Ministry of Emergencies, which is usually considered a relatively well-functioning agency of the Russian administration. In this case the role of governors was primarily associated with identification of problem and lobbying for substantial federal support. However, the importance of this information transmission task is different for different regions. Regions with large population (and, specifically, better organized and better educated urban population) are more likely to receive large attention of the federal government anyway: there may be alternative signals

[23] For example, the Sakha region in Siberia is about 395 times larger than the Adygea region, or about 14 times larger than the average Russian region.
[24] A few regions did not report any public expenditures on forestry for some years.

from the population, federal officials should be monitoring these regions more closely, and also the fact that for these regions the economic costs of wildfires can be large is more evident – hence, larger attention of the central government should be present also because of this reason. Thus, we expect the effect of the federal connections and local origin of the governors to be different for regions with different size of the population and, specifically, urban population.[25]

Our dataset in the basic specification includes 71 regions. We have to exclude a number of regions from our sample. First of all, we exclude Chechnya and the three "autonomous okrugs".[26] While for war-torn Chechnya no reliable data exists, the autonomous okrugs are administrative sub-units of other regions what makes it difficult to disentangle the explicit line of authority. Second, we exclude Moscow City and St. Petersburg City as they do not report any forest statistics (because they have no forests). Third, we exclude Chuvash region, since its respective governor was dismissed by the federal administration in August 2010. Most likely, it was a coincidence, as there is no evidence that forest fires had any effect in this case.[27] Nevertheless, for this region we cannot confidently isolate the effect of the resigning governor from this successor. Although occasionally wildfires happen throughout the year, the disastrous forest fires in 2010 were mainly concentrated in end of July until the beginning of September (which is the focus period for our investigation). In latter robustness checks we will also exclude the governors that were dismissed in July and August. Finally, we exclude all regions which reported no forest fires in 2010. We assume that the five regions without any fire were not affected "by chance" or simply as a result of their topography (e.g. mountainous area with little forest coverage in the North Caucasus).[28] To account for the unlikely possibility that these regions were the most effective in forest fire monitoring we will relax this assumption in a further robustness test, including these regions in our sample as

[25] One should note that urban population is *not* correlated with the indices of local origin (both binary and using a four-point scale) and federal connections – the Spearman and Pearson correlation coefficients are below 0.1 and insignificant. In the same way, there is no significant difference in the urban population between regions with different level of local origin or federal connections, if one uses the mean comparison. Thus, we can use the interaction terms without encountering the problem of multicollinearity.

[26] As of 2010 three of the 83 Russian regions are so-called "autonomous okrugs" which were created to „provide autonomy to indigenous people of the North" (at least to certain extent) (Khanty-Mansi Autonomous Okrug, Nenets Autonomous Okurg, and Yamalo-Nenets Autonomous Okrug). „"Autonomous okrugs" are subgroups of Russian regions which are simultaneously part of the federation and of other regions. In 2009 there had been three autonomous okrugs: Yamalo-Nenets, Yamalo-Nenets (both belong to Tuimen region) and Nenets (Arkhangelsk)." This exclusion of Chechnya and the three autonomous okrugs is a standard procedure in the empirical analysis of Russian regions.

[27] In fact Chuvash performed above average in terms of our dependent variable.

[28] The five regions without any reported forest fires were Tula, Kalmykia, Ingushetia, Kabardino-Balkaria, and North-Ossetia regions.

well. We have averaged most explanatory variables over 10 years (2000-2009) to capture the long-term characteristics and estimated a cross-section.

5. Results

5.1. Preliminary estimates

Table 1 summarizes our basic results. In the specification (1) - (6) we regress our dependent variable on a number of region-specific covariates. We find a highly significant and positive coefficient for the size of the regional territory. The share of forest in the overall territory and the long-term temperature has the opposite effect. The respective coefficients are significant and negative which indicate that regions with a relatively large forest area and "historically" high temperatures are good at monitoring and clearing forest fires. The most likely explanation for this finding is that particularly these regions have a higher experience in dealing with wildfires, since they have a larger intraregional interface between densely populated regions and forests area. The remaining covariates, namely the long-term rainfall in July, regional expenditures on forestry and urban population have no significant effect.

In regression (2) we turn our attention to the potential effect of the governor's local origin on the monitoring effectiveness. Neither the local origin, nor the coefficient of the interaction term with urban population, which we introduce in regression (3), turn out to be significant. Thus, it looks like forest fire management seems not to be influenced by the fact whether a governor is an "outsider" or an "insider" and ultimately by his local knowledge. In regression (4) we add the federal connections dummy. On its own the variable is insignificant. However, when we interact it with the urban population in regression (5) the situation changes entirely. Now the effect of the federal connections is significant and negative, i.e. federal connections improve the quality of forest fire management. *Figure 2* reports the marginal effects of federal connections for different levels of urban population. One can see that there is a significant and negative coefficient reported for federal connections dummy for regions with low urban population size (i.e. in these regions federal connections improve the quality of forest management); for high urban population size we find no significant effects. The results are even more convincing if one takes into account that there are only two (!) regions in our sample for which log urban population exceeds 15 (i.e. 3.2 mln – Moscow Region and Sverdlovskaya region).[29] Thus, the effect is actually significant for the major part of the sample.

[29] Moscow City and St. Petersburg with larger urban population are excluded from the sample

Our first conclusion therefore seems to be unequivocal: in Russia federal connections matter a lot in obtaining resources from the federal government, particularly if the regions receive smaller attention of the federal administration anyway (due to their small urban population size). We perform a number of robustness checks attempting to identify the impact of further control variable on our results, using regression (6) as baseline specification. To start with, we add a number of region-specific covariates. We control for economic variables such as income per capita in the region in 2010 and the average share of investments in fixed assets in the regional GRP in 2000-2009 to measure the overall level of development of the region.[30] We further add fiscal transfers (measured by the share of fiscal transfers from all budgets in the de-facto expenditures of the regional consolidated budget) to understand insofar region received general support from the federal government regardless of the forest fires situation, averaging this indicator over 2000-2009 as well. We also control for the level of crime in the region (number of crimes registered per 100,000 people), which could be associated with lawless behavior of the population in general (and thus contribute to both spread of fires and difficulty to mobilize resources to combat them). Finally, the "local knowledge" is not the only aspect we have to take into account in our study. A further aspect of knowledge is associated with the "general knowledge", i.e. the level of education and further training of governors and their staff. Therefore it is interesting to look at the variation of education of public officials working in the regional administration. Unfortunately, we do not have detailed data for their educational background, but since 2008 Rosstat publishes information on the number of regional bureaucrats participating in the professional development educational program. We include this variable in regressions as well.

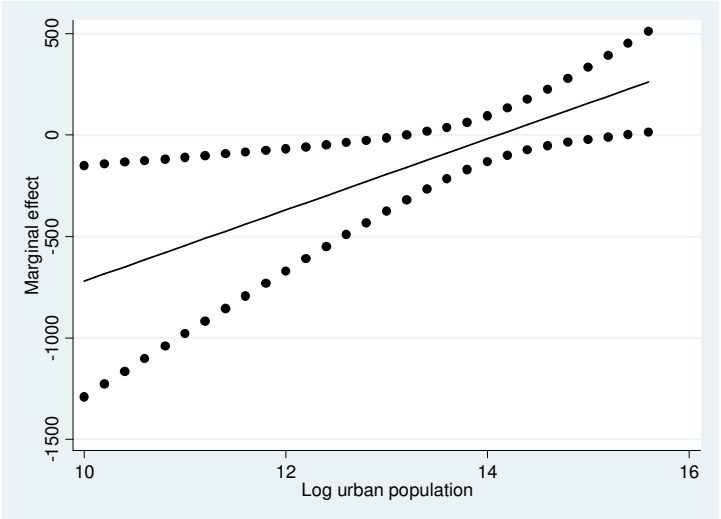


Figure 2: Marginal effect of federal connections on monitoring effectiveness conditional on the size of urban population. Note: 90% confidence intervals are used.

[30] Most region-specific variables we use come from the Rosstat.

Table 1: Impact of local origin and federal connections on forest fire monitoring effectiveness in 2010; dep. var.: forest area covered by fire divided by the number of reported fires

	OLS (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)	OLS (6)
Log area	**97.870****	**94.996****	**95.130****	**95.780****	**100.119****	**100.760****
	(39.19)	**(39.48)**	**(39.75)**	**(39.48)**	**(38.68)**	**(39.71)**
Share of forest	**-6.312*****	**-6.366*****	**-6.376*****	**-6.429*****	**-6.237*****	**-6.254*****
	(2.31)	**(2.32)**	**(2.32)**	**(2.34)**	**(2.20)**	**(2.22)**
Temperature	**-71.446****	**-74.534****	**-74.653****	**-70.560****	**-61.899****	**-62.097****
	(31.74)	**(31.24)**	**(31.18)**	**(31.13)**	**(28.67)**	**(28.01)**
Rain	-2.420	-2.415	-2.405	-2.044	-1.339	-1.312
	(2.47)	(2.51)	(2.55)	(2.51)	(2.46)	(2.51)
Forestry expenditure	-2.055	-1.945	-1.953	-1.730	-1.970	-2.021
	(1.28)	(1.37)	(1.35)	(1.49)	(1.28)	(1.29)
Log urban population	-100.784	-95.441	-84.318	**-106.487***	**-161.210****	-128.537
	(63.13)	(61.52)	(133.45)	**(63.35)**	**(78.54)**	(155.72)
Local origin		18.972	68.810			151.732
		(28.05)	(654.95)			(663.28)
Log urban population*local origin			-3.608			-10.973
			(46.47)			(46.89)
Federal connections				-89.259	**-2,472.785****	**-2,535.280***
				(87.34)	**(1,171.17)**	**(1,290.07)**
Log urban population* federal connections					**175.297****	**180.312***
					(83.463)	**(92.492)**
Constant	2,795.266**	2,734.661**	2,582.12	2,855.739**	3,374.216**	2,920.77
	(1,182.35)	(1,179.38)	(2,182.08)	(1,194.20)	(1,318.78)	(2,378.71)
Observations	71	71	71	71	71	71
R^2	0.422	0.424	0.424	0.428	0.451	0.451

Notes: robust standard errors in parentheses. *** 1% significance, ** 5% significance, * 10% significance. Robust standard errors in parentheses and significant results are marked bold.

Since our aim is to understand how the variation in governor's local origin and federal connections could affect the effectiveness with which forest fires were managed during the crisis period we also control for a battery of governor-specific variable.[31] First we control for the governor's professional background. We use three dummies distinguishing between governors who have worked as businessmen, engineers, and bureaucrats before their inauguration (or pre-political career).[32] Second, we control for the affiliation of a governor with business groups by including a dummy for business connections. The dummy we use is based on the detailed screening of media reports and indicates all governors, who have been claimed to have large shares in private companies or to have strong ties to private businesses in any other form.[33] Third, we create a dummy for governors, who previously held a high-level position in the regional administration (e.g. vice governor, regional government, or member of regional parliament, mayor of the regional capital), which is designated "regional office". Fourth, we control for the Edinaya Rossiya membership: as mentioned, most governors either belong to it, or support it, but there still may be differences between members and non-members. Fifth, we control for the duration of tenure of the governor and

[31] The governor-specific variables have been developed by screening the governors' biographies from various sources.
[32] The omitted and smallest group of governors has either worked in the armed forces or uncommon professions.
[33] We use the variable developed in Libman et al (2011a) with some adjustments.

his age (which could also affect his behavior, see Jong-A-Pin and Mireau 2011 for the discussion of this issue for autocracies).

Table 2: Impact of local origin and federal connections on forest fire monitoring effectiveness in 2010; dep. var.: forest area covered by fire divided by the number of reported fires; region-specific covariates

	OLS (6)	OLS (7)	OLS (8)	OLS (9)	OLS (10)	OLS (11)
Log area	**100.760****	**78.635***	**77.504***	**76.848***	**87.371***	**106.085****
	(39.711)	**(39.918)**	**(40.994)**	**(42.267)**	**(46.437)**	**(48.021)**
Share of forest	**-6.254*****	**-5.277****	**-5.336****	**-5.317****	**-4.783****	**-4.166***
	(2.218)	**(2.025)**	**(2.075)**	**(2.137)**	**(2.240)**	**(2.139)**
Temperature	-2.021	-2.290	-1.148	-1.125	-1.074	-1.000
	(1.290)	(1.645)	(1.382)	(1.459)	(1.396)	(1.447)
Rain	**-62.097****	**-32.149***	-28.794	-28.979	-26.272	-15.219
	(28.009)	**(19.197)**	(18.967)	(19.057)	(18.930)	(20.869)
Forestry expenditure	-1.312	-0.458	-0.105	-0.125	0.254	0.268
	(2.506)	(2.331)	(2.247)	(2.334)	(2.480)	(2.565)
Log urban population	-128.537	-158.023	-130.542	-127.499	-139.095	-88.400
	(155.720)	(167.107)	(163.182)	(148.406)	(146.129)	(158.646)
Local origin	151.732	144.753	206.841	206.375	216.104	372.508
	(663.283)	(667.135)	(678.280)	(688.973)	(679.760)	(709.856)
Log urban population*local origin	-10.973	-11.026	-15.457	-15.430	-16.016	-25.781
	(46.888)	(46.764)	(47.543)	(48.256)	(47.634)	(49.510)
Federal connections	**-2,535.280***	**-2,434.541****	**-2,243.107****	**-2,240.545***	**-2,311.386****	**-1,827.245***
	(1,290.070)	**(1,152.610)**	**(1,118.450)**	**(1,123.300)**	**(1,048.010)**	**(1,024.350)**
Log urban population* federal connections	**180.312***	**173.490****	**159.479****	**159.257***	**163.961****	**130.420***
	(92.492)	**(82.134)**	**(79.418)**	**(79.756)**	**(74.776)**	**(72.411)**
Income		0.022	0.027	0.028	0.028	0.029
		(0.017)	(0.022)	(0.024)	(0.024)	(0.024)
Investments			-6.229	-6.221	-6.426	-6.753
			(7.284)	(7.298)	(7.10)	(7.21)
Fiscal transfers				26.138	-39.109	30.185
				(375.65)	(458.47)	(488.28)
Crime					-55.096	-92.202
					(96.04)	(78.04)
Education of bureaucrats						4,959.93
						(4,811.71)
Constant	2,920.770	2,447.410	1,922.280	1,877.140	2,028.460	439.5750
	(2,378.71)	(2,263.35)	(2,207.08)	(2,018.32)	(2,022.63)	(2,738.65)
Observations	71	71	71	71	71	71
R^2	0.451	0.476	0.479	0.479	0.482	0.503

For notes see *Table 1*.

The results for the region-specific variables are reported in *Table 2*, and for governor-specific variables in *Table 3*.[34] Basically, our main effects remain robust. However, it is interesting to notice that the coefficient of United Russia membership is negative and significant. Thus being a member of the party of power turned out to be a positive attribute for governors during the forest fires in 2010 (during the period of the forest fires only 6 governors were not member of United Russia). The result can be interpreted along our initial hypothesis that closes ties to the federal center have a positive effect matter crisis management in terms

[34] In all tables we also include the baseline specification (6) for comparison.

forest fire monitoring effectiveness. Although we control for two other sources of local knowledge (age and tenure) and found no effects as well. We have also interacted the tenure duration with urban population which however turns out to be insignificant.[35]

In addition, we controlled for the number of times governors have been (re-)elected and (re-)appointed, as well as included a dummy for governors who never run for regional elections (currently there are no governors which not at least once have been appointed). The three electoral covariates are insignificant and do not change our main significant explanatory variables.[36]

[35] We also test for the interaction between governor's age and urban population, which however, is insignificant.
[36] Results are available upon request.

Table 3: Impact of local origin and federal connections on forest fire monitoring effectiveness in 2010; dep. var.: forest area covered by fire divided by the number of reported fires; controlling for governor-specific covariates

	OLS (6)	**OLS (12)**	**OLS (13)**	**OLS (14)**	**OLS (15)**	**OLS (16)**	**OLS (18)**	**OLS (19)**
Log urban population	-128.537	-121.748	-134.95	-128.511	-115.389	-164.566	-136.411	-81.259
	(155.72)	(157.45)	(158.67)	(154.27)	(153.60)	(169.49)	(159.36)	(174.82)
Local origin	151.732	202.915	83.876	166.275	219.502	39.005	132.164	128.644
	(663.28)	(699.49)	(686.20)	(675.04)	(662.23)	(658.83)	(670.81)	(709.15)
Log urban population*local origin	-10.973	-15.083	-6.278	-11.708	-15.784	-3.311	-10.062	-10.235
	(46.89)	(49.69)	(48.38)	(47.40)	(46.83)	(46.44)	(47.39)	(50.18)
Federal connections	**-2,535.280***	**-2,583.100***	**-2,560.357****	**-2,561.053***	**-2,752.237****	**-2,740.360***	**-2,605.434***	**-2,468.555***
	(1,290.07)	**(1,367.57)**	**(1,278.47)**	**(1,282.63)**	**(1,269.98)**	**(1,428.19)**	**(1,340.33)**	**(1,286.88)**
Log urban population*federal connections	**180.312***	**186.126***	**181.694***	**181.702***	**196.840****	**194.602***	**186.850***	**176.135***
	(92.49)	**(100.64)**	**(91.83)**	**(92.06)**	**(91.51)**	**(102.06)**	**(97.33)**	**(92.79)**
Businessmen		12.115						
		(105.27)						
Engineers		126.895						
		(189.72)						
Bureaucrats		15.198						
		(107.09)						
Business connections			-83.597					
			(71.49)					
Regional office				-27.389				
				(75.22)				
United Russia membership					**-142.616***			
					(80.39)			
Age						5.867		
						(8.06)		
Tenure							0.015	0.495
							(0.02)	(0.93)
Tenure*log urban population								-0.035
								(0.07)
Covariates from *Table 1*	yes	yes	yes	yes	yes	yes	yes	yes
Constant	2,920.77	2,717.92	2,968.82	2,935.86	2,934.28	3,062.98	2,973.96	2,266.42
	(2,378.71)	(2,386.16)	(2,426.79)	(2,345.69)	(2,346.96)	(2,398.72)	(2,422.09)	(2,448.93)
Observations	71	71	71	71	71	71	71	71
R^2	0.451	0.462	0.458	0.452	0.458	0.459	0.454	0.462

For notes see *Table 1*.

Table 4: Impact of local origin and federal connections on forest fire monitoring effectiveness in 2010; dep. var.: forest area covered by fire divided by the number of reported fires; further robustness checks

	OLS (6)	OLS (20)	OLS (21)	OLS (22)	OLS (23)	OLS (24)	OLS (25)
Log urban population	-128.537	-169.877	-85.681	-85.681	-232.582	-188.859	-134.942
	(155.72)	(187.72)	(188.54)	(188.54)	(188.62)	(155.80)	(163.74)
Local origin	151.732	-69.871	165.976	165.976	-262.473	-176.81	106.093
	(663.28)	(858.46)	(862.56)	(862.56)	(728.20)	(581.36)	(706.93)
Local origin*log urban population	-10.973	3.445	-13.569	-13.569	16.574	12.481	-7.931
	(46.89)	(59.79)	(59.85)	(59.85)	(52.19)	(41.07)	(49.82)
Federal connections	**-2,535.280***	**-2,356.642****	**-1,690.553***	**-1,690.553***	**-2,741.111***	**-1,933.639***	**-2,590.079***
	(1,290.07)	**(1,095.37)**	**(954.45)**	**(954.45)**	**(1,451.15)**	**(1,104.03)**	**(1,317.36)**
Federal connections*log urban population	**180.312***	**165.696****	**118.971***	**118.971***	**189.460***	**137.229***	**184.027***
	(92.49)	**(78.71)**	**(69.03)**	**(69.03)**	**(105.20)**	**(78.81)**	**(95.29)**
Central district		111.558	-159.713	191.438			
		(124.64)	(295.13)	(123.34)			
Northwest district		-241.016	-473.5	-122.348			
		(215.61)	(362.79)	(175.72)			
South district		**270.504****	-97.362	**253.790****			
		(120.51)	-258.33	**(112.36)**			
Ural district		174.331	-84.512	266.639*			
		(139.93)	(267.49)	(142.11)			
Volga district		130.208	-175.458	**175.694***			
		(100.64)	(286.74)	**(100.89)**			
Siberia district			-351.151				
			(249.49)				
Fareast district				351.151			
				(249.49)			
Pine					-0.071		
					(0.06)		
Spruce					-0.02		
					(0.02)		
Larch					0.003		
					(0.00)		
Cedar					-0.088		
					(0.08)		
Fir					-0.029		
					(0.09)		
Oak (seed origin)					-0.375		
					(0.69)		
Oak (vegetative origin)					0.801		
					(0.48)		
Alder					-0.334		
					(0.69)		
Maple					-3.956		
					(4.87)		
Ash					3.735		
					(4.24)		
Stone birch					**-0.283****		
					(0.11)		
Lime					0.175		
					(0.73)		
Birch					0.004		
					(0.07)		
Aspen					**0.520***		
					(0.29)		
Covariates from Table 1	yes	yes	yes	yes	yes	yes	yes
Regions with zero forest fires included	no	no	no	no	no	yes	no
Governors dismissed in July-September all excluded	no	no	no	no	no	no	yes
Constant	2,920.770	3,978.480	3,018.250	2,667.090	**5,519.794***	3,890.250	3,074.910
	(2,378.71)	(3,278.89)	(3,105.13)	(3,031.05)	**(2,857.18)**	(2,415.00)	(2,529.32)
Observations	71	71	71	71	71	76	68
R^2	0.451	0.505	0.534	0.534	0.611	0.436	0.453

For notes see *Table 1*

In the *Table 4* we report a number of further robustness checks (all of them confirm our initial results). First, we control for the specifics of the geographic location of the Russian

regions. In specification (20) we add dummies for five federal districts of the European part of the country. In specification (21) and (22) we add the two Asian districts (Siberia and Far East) one by one (to avoid the dummy variable trap). In regression (23) we take the specifics of the local forest in account. The tree type could have possibly contributed to the spread of forest fires. We divide Russia in several zones depending upon the spread of particular tree types in its forests and include dummies for regions belonging to particular zones. Although the appearance of stone birch (its occurrence is restricted to the Far East Federal District) trees has a positive effect and aspen trees contribute negatively to expansion of forest fires, our main explanatory variables remain robust. Regression (24) includes the regions, which had no fires reported (which we have excluded before). Now we assume these regions to be extremely efficient at forest fires prevention, setting the dependent variable to be equal to zero. Regression (25) excludes the governors, which have been dismissed not only during the active forest fires period, but throughout the entire period of July-September 2010. Once again, our results are confirmed.

5.2. Interaction of local origin and federal connections

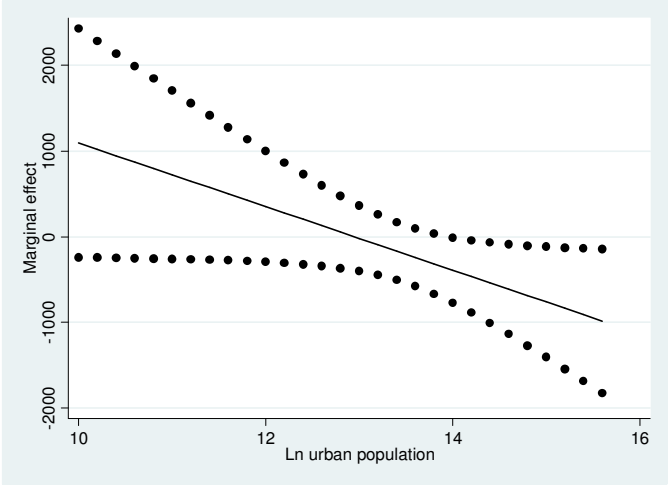
Although we have shown that the governor's level of local knowledge measured by his origin seems to have no significant effect we suspect that the interrelationship of the effects of federal connections and local origin are more complex. In order to investigate into the potential interrelated effects of local origin and federal connections we investigate their interaction. At this stage it should be noted that both explanatory variables show a rather small correlation (for our sample r = -0.185).[37] The direction of the correlation is intuitive as governors with a high level of local origin are less likely to have worked in federal institutions, since they have spent most of the time in the region. However, as the small correlation indicates this relationship is not very strong. We approach this issue by estimating the basic regression (6) including urban population, local origin and federal connections, as well as all possible double and triple interactions terms between these variables. For interpreting this equation we follow Brambor et al. (2006) specifically considering the variation in significance levels for different parts of the sample. *Figure 3* reports the marginal effect of federal connections on forest fire monitoring for various levels of urban population. As it is usually done with the analysis of triple interaction effects, we present the marginal effect of federal connections conditional on urban population for various levels of local origin. One can see that if local origin is very low, the presence of federal connections has no

[37] For local origin dummy, which we have described in section 3 as an alternative, the correlation is only r = -0.139

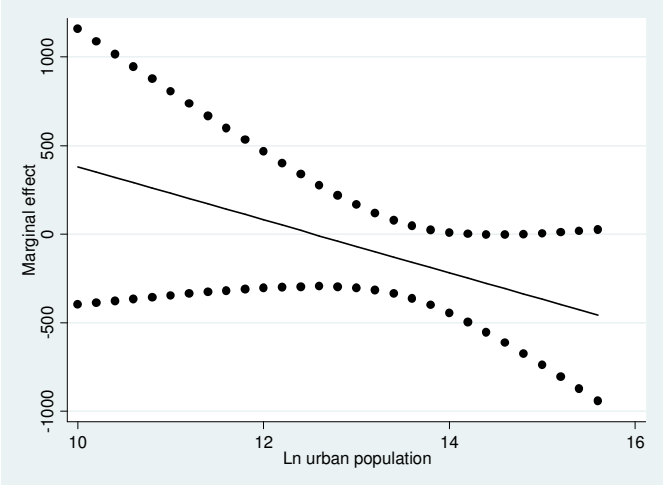
significant effect on monitoring effectiveness. Only for local origin equal to 4 federal connections dummy has a significant effect improving effectiveness of forest fire management. Furthermore, for the local origin of 4 the effect is almost twice as high as for the local origin of 3 (the latter is insignificant though). Therefore, the only combination when federal connection supports monitoring effectiveness if local origin is high enough.

If one in the same way plots the marginal effects of local origin on the effectiveness of monitoring (*Figure 4*) the results are still unequivocal: for low level of federal connections local knowledge does not matter, for high level of federal connections it produces a significant effect improving the quality of forest fire management for regions with low urban population. Thus, while federal connections help in the presence of local origin, local origin helps in the presence of federal connections. One can cautiously interpret this result as an indication that local origin still has a positive effect even in a highly centralized system, like that of Russia; however, *only* in combination with federal connections. One could hypothesize that the federal connections were influencing the access to resources, and local knowledge the efficient use of resources. For example, the governors better connected to the central government could better lobby for receiving support in various forms (i.e. financial means, equipment, allocation of effort of the Ministry of Emergencies etc.). However, once the respective means did arrive in the region, the local knowledge was instrumental to prevent their wasteful use and optimally employ them combating the forest fires.

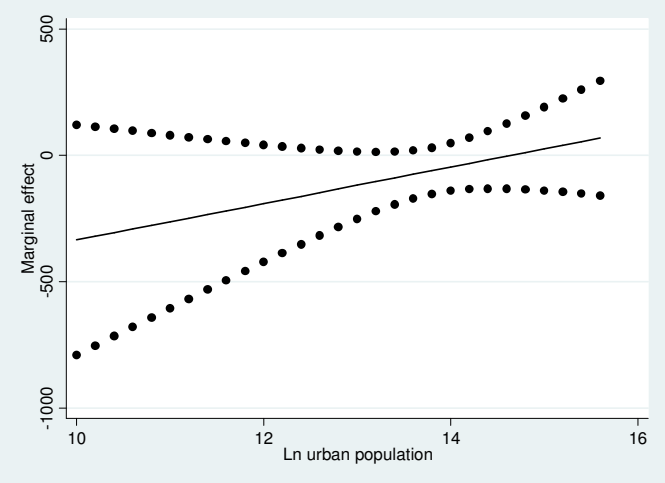
Figure 3: Marginal effect of federal connections on monitoring effectiveness conditional on the size of urban population for different levels of local origin, triple interaction term



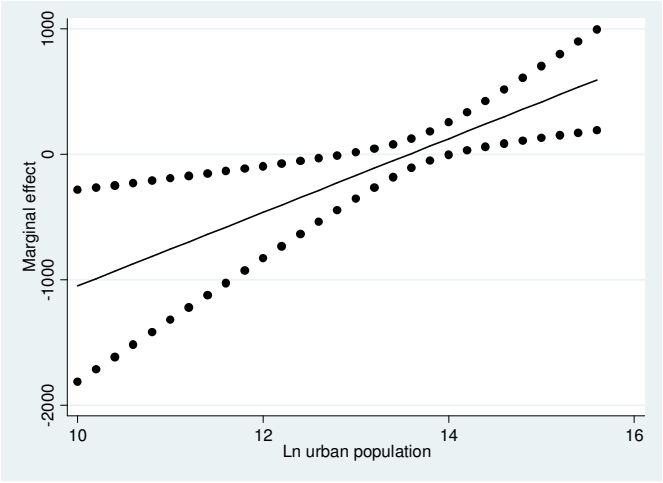
Local origin = 1



Local origin = 2



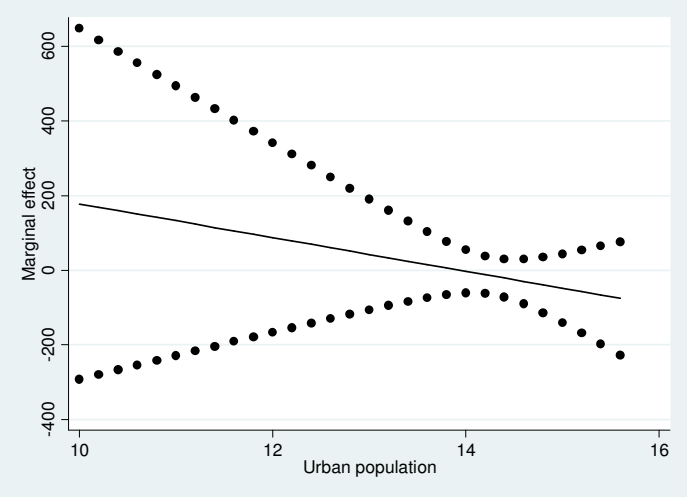
Local origin = 3



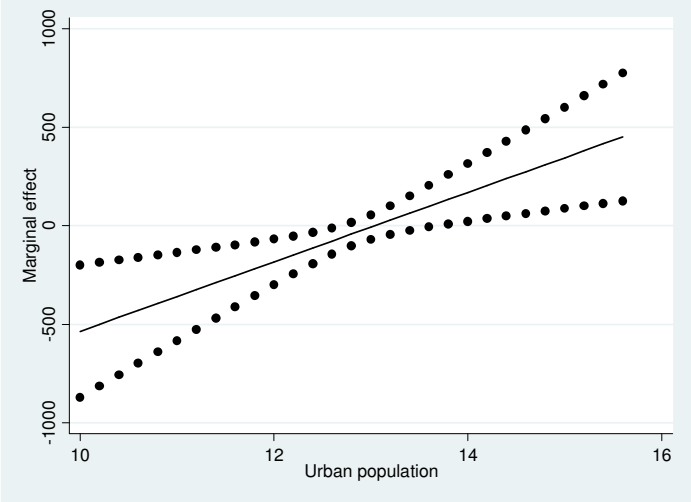
Local origin = 4

Note: 90% confidence intervals are used

Figure 4: Marginal effect of local origin on monitoring effectiveness conditional on the size of urban population for different levels of federal connections, triple interaction term



Federal connections = 0



Federal connections = 1

Note: 90% confidence intervals are used

6. Robustness checks

6.1. Population and population density

In order to validate our results, we used an extensive array of robustness checks. To start with, the use of the urban population as a key variable to measure the extent of importance of information transmission task to be handled by the regional governor, and also to account for the importance of "human factor", both contributing to the spread of fires and influencing the costs of wildfires in economic terms. It is possible, however, to use alternative indicators in this respect. Specifically, we apply two of them: overall population and population density. The effects of the overall population are similar to that of urban population. High population density also increases the possible costs of wildfires in economic terms and in terms of human life, once again making the region more important in the eyes of

the federal government (and reducing the need for the federal connections of the governors to ensure the information transmission). In *Appendix D* we report the outcomes of the estimates of regressions with triple interaction terms, where urbanization is replaced by population and by population density. One can see that the results remain essentially the same as in the baseline regressions. Thus, our results are confirmed.

6.2. Binary local origin variable

As already mentioned, the allocation of governors to individual sub-groups in the local origin index we have described could be subject to criticism. Therefore we designed a simplified measure of local origin: a binary variable, equal to zero for governors with the original local origin index of 1 and 2, and to one for those with original local origin index of 3 and 4. Then we re-estimated the main regressions using this variable. The results are reported in *Appendix E.* Now, the outcomes of our estimates reveal an even more interesting pattern. If one estimates the regressions without triple interaction terms, we still confirm that for low urban population federal connections improved the quality of forest fires management. The impact of the local origin is now significant even without triple interactions, but reverse: regions with low population, ruled by governors with local origin, have been *less* efficient in combating fires. This strange result, however, become clearer if we look at triple interaction terms. First, federal connections improve the quality of forest fires management only if the local knowledge is present. Second, local knowledge has the negative influence only if the federal connections are absent.

Thus, once again, the best combination is associated with high local origin *and* federal connections. However, the *worst* combination is to have *high* local origin and *low* federal connections. There are several reasons why this effect could be present. Governors with local origin may be generally perceived by the federal administration with greater mistrust, given the Russian history of strong regional princes competing for power with the federal center in the 1990s. Thus, any demands they make (if the support is required) are more likely to be ignored or dismissed. The presence of the federal connections seems to "overwhelm" this negative effect, making sure that the federal government "does pay attention" to the governor, even if he does have local origin. However, among the governors, who have no federal connections, governors without local origin are likely to be treated as "less" suspicious and

therefore have higher probability of receiving federal support essential to resolving the problem they encounter.[38]

6.3. Spatial autocorrelation, spillovers of policies and outliers

So far we have interpreted the forest fires management in individual regions as purely independent from the developments in the neighboring territories. This approach is, however, possibly flawed. In reality there may be strong positive (or negative) externalities from good (or bad) forest fires management in the neighboring regions: forest fires do not stop at official regional borders. On the other hand, the territory of Russian regions is relatively large, so that the spatial interdependence of policy effects may actually be small (the intra-regional occurrences of wildfires are numerous and play a larger role than "export" of forest fires from other regions). In order to capture this problem, we added a number of spatial regressions to our estimates. We use two spatial matrices: the matrix measuring inverse distances between capitals of Russian regions (we apply the matrix by Abramov (2008) capturing the travel distances by railroad, the most popular form of high-distance transportation in Russia, as well as by other means if no railroad connection exists) and a binary matrix assigning 1 to the neighboring pairs of regions and 0 otherwise. Clearly, both measures are imperfect, since the territory of some Russian regions is itself very large, yet provide us at least with a crude measure of spatial interdependence. In order to ensure the robustness of our results, we run both spatial error and spatial lag regressions, estimating them (to avoid endogeneity) by maximum likelihood, as it is common in the literature. The results for the baseline estimations are reported in *Table 5.* One can see, however, that we do not find strong spillovers from forest fires management in Russia; the spatial terms (rho and lambda) are insignificant, and the tests reject the presence of spatial autocorrelation and the interdependence in the error terms. Our main results remain almost always robust.

Furthermore, we have to make sure that our results are not driven by outliers. For this purpose, based on the baseline specification OLS (6), we have calculated Cook`s D values, widely used in research as the tools of outlier identification. Basically, for no region we obtained the Cook's D large 1, which is a suggested benchmark for influential observations. The highest values were generated for Magadan (0.489). This region is indeed characterized

[38] In this specification we also find significant effects for large urban population, which are reversed as opposed to what has been discussed. However, as already mentioned, these significant results correspond merely to two regions of our sample: Moscow Region (the second largest in Russia after the City of Moscow with the population of 5.8 mln. people) and Sverdlovskaya region (the fourth largest after City of Moscow, region of Moscow and St. Petersburg) with 3.8 mln. people. Thus, these parts of the graphs are purely counterfactual and should not be over-interpreted.

by very low quality of forest fires protection. However, if Magadan is excluded, the interaction effect of local origin and federal connections remains robust (also in the triple interaction effect). Thus, we can claim that the outliers do not affect our findings.

Table 5: Impact of local origin and federal connections on forest fire monitoring effectiveness in 2010; dep. var.: forest area covered by fire divided by the number of reported fires, spatial regressions

	ML (ML1)	ML (ML2)	ML (ML3)	ML (ML4)
Log area	**101.426*** **	**100.057*** **	**73.151***	**88.63***
	(38.55)	**(36.58)**	**(39.54)**	**(51.756)**
Share of forest	**-6.262*** **	**-6.253*** **	**-5.486*** **	**-6.172*** **
	(2.06)	**(2.05)**	**(2.02)**	**(2.43)**
Temperature	**-62.096*** **	**-62.150*** **	**-55.247*** **	**-64.348*** **
	(25.91)	**(26.24)**	**(24.86)**	**(26.889)**
Rain	-1.271	-1.321	-1.435	-1.266
	(2.27)	(2.28)	(2.17)	(2.31)
Forestry expenditures	**-2.032***	**-2.024***	-1.547	-1.408
	(1.22)	**(1.21)**	(1.06)	(2.20)
Log urban population	-129.506	-129.232	-79.947	-116.215
	(141.40)	(143.75)	(124.10)	(150.59)
Local origin	150.413	148.309	272.155	172.313
	(609.22)	(608.68)	(588.07)	(588.283)
Log urban population*local origin	-10.876	-10.728	-19.676	-12.812
	(43.07)	(43.07)	(41.22)	(41.20)
Federal connections	**-2546.068*** **	**-2535.502*** **	**-2250.007***	-2340.471
	(1191.67)	**(1223.17)**	**(1167.36)**	(1531.44)
Log urban population*federal connections	**181.069*** **	**181.057*** **	**160.542***	165.643
	(85.52)	**(87.85)**	**(84.114)**	(110.140)
ρ	-0.052		0.225	
	(0.71)		(0.25)	
λ		-0.038		0.111
		(0.72)		(0.34)
Constant	2932.075	2935.387	2198.046	2850.086
	(2175.15)	(2223.69)	(1982.20)	(2427.72)
Observations	71	71	70	70
Wald test ρ = 0	0.005		0.825	
LM test ρ = 0	0.003		1.772	
Wald test λ = 0		0.003		0.109
LM test λ = 0		0.002		0.206
Spatial matrix	Inverse distance	Inverse distance	Binary borders	Binary borders

Notes: see Table 1

7. Discussion

7.1. Local knowledge, governors and elites

While the results demonstrated above support the robustness of our findings, there are still several aspects of how we *interpret* our results, which may be questionable. To start with, the idea that it is the local knowledge of one individual (the governor) which determines the success of regions in the forest fires management may be subject to criticism. Clearly, it is not the governor himself who collects the information on wildfires; rather the results of his work are conditional on the performance of the public officials. Here, however, a clarification of

what "local knowledge" could actually mean in a federal system is required. It has long been acknowledged in the literature on interest groups (where information provision is crucial as well) that the success is dependent rather on the knowledge of how and where to acquire information than on knowledge of specific facts as such: interest groups are rather "experts in using experts" (Heclo 1978: 103) able to acquire information through networking (see Carpenter et al. 1998; 2004). Involvement in local networks is also crucial in terms of local knowledge of regional politicians in federations (Jin et al. 2005). In the Russian case, while officially there exist some guarantees of lifelong appointment for bureaucrats, in reality new governors usually change at least the top of the bureaucratic hierarchy; there are also strong changes on the intermediate level in the bureaucratic staff. Hence, the key reason why local knowledge should matter for governors is probably their ability to select the "right" bureaucrats able to provide them with the flow of adequate information, as well as ability to assess the importance of different information flows. Given the weakness of formal institutions in Russia, the personality of the governor matters even more for the organization of these information flows than in the developed world.

Nevertheless, the importance of local elites and bureaucrats for the forest fire management could create a further problem: another form of omitted variable bias we fail to capture with our research design. Particularly, it is possible that the appointment of governors and the effectiveness in forest fires prevention are both correlated with the properties of local elites. Consider, for instance, the case of highly "patriotic" local elites ready to engage into protection of their region, on the one hand, and ensuring that only a "local" governor gets an appointment, on the other hand by pressuring the federal administration. In this case the elites could perform excellently while combating forest fires and at the same time be the reason for the local origin of the governor ruling in the region. In the same way, possibly appointment decisions take into account the overall quality of local governance, which in turn is associated with better forest fires protection.

We have attempted to check for this problem controlling for a set of region-specific characteristics potentially generating either more "patriotic" or more "efficient" local elites and *at the same time* able to influence the appointments. To start with, while discretion of the federal government with respect to appointments is large, it has always been claimed to be more limited for ethnic republics and, especially, Northern Caucasus. In the same way, the central government may be more cautious in appointing bureaucrats to the distant regions without consulting local elites: Libman (2010) for a study of decentralization in Russia in 1995-1999 shows that distance from Moscow is the only factor consistently influencing the

degree of autonomy achieved by Russian regions. At the same time, non-Russian ethnic regions might have more patriotic elites. Thus, we re-estimated our regressions, controlling for (a) dummy republic; (b) share of ethnic Russian population (using the census data of 2002); (c) index of ethno-linguistic fractionalization calculated following Alesina and La Ferrara (2005), as well as the polarization index for ethnic structure, which might be a better proxy for the intra-regional conflicts; (d) distance between the regional capital and the City of Moscow; (e) average oil and gas extraction in the region in 2000-2007 in coal equivalents (the aim of this variable is to account for possible specific power position of Russian regions with substantial oil resources) and (f) dummy for ethnic republics of Northern Caucasus. These modifications, however, have no influence on our results whatsoever. Other characteristics potentially affecting the appointments and the motivation of local elites (particularly, economic potential of the regions) have already been controlled for in the baseline specifications.

Furthermore, we attempted to capture the effectiveness of local government using a set of various indices of the quality of regional governance. While we acknowledge that their quality may be disputable, we still hope that by using a broad array of region-specific institutional characteristics we are able to capture the possible quality of governance in the region. We use, specifically, three sets of variables.

1. Since 2007, the Russian Ministry of Economic Development regularly publishes an index of efficiency of regional governments, based on a broad range of quantitative indicators. We use two indices: the overall efficiency ranking for 2009 and the ranking of improvement of efficiency in 2007-2009, since the "improvement of efficiency" is officially declared as the goal for the regional governments in Russia. The index is based on numerous quantitative characteristics of regional economy and budgets. Specifically, the regions are divided into four groups according to their place in the ranking (first three including 20 regions each, and the last 23 regions): the resulting indicators varying from 1 to 4 are included in the regressions.
2. However, using data from the governmental institutions (or even published in association with the governmental institutions) may be problematic, since the independence of evaluation is by far not guaranteed. For this purpose we used an independent ranking based on expert opinion evaluation published by Aleskerov et al. (2006) and measuring the efficiency of public administration in Russian regions. Specifically, four rankings are available: the extent of application of objective-oriented public management, internal organization of bureaucracy and interaction with recipients of public services, as well as

an integrated ranking of the quality of regional administration; we use each of them in our regressions. Aleskerov et al. assign a value of A+, A, B or C to each region according to each dimension of their ranking: we transform them obtaining an index varying from 1 to 4

3. We also control for the level of regional democracy in the early 2000s, using two indicators: an expert-opinion based index of democracy of the Carnegie Center Moscow (2000-2004) and the index of freedom of the press of Public Expertise Institute (1995-2005). Both of them are widely used in the literature (mostly in political science) and may have strong impact on both efficiency and patriotism of local governments and appointment practices. One has to acknowledge that the substantial political changes in Russia in the second half of the 2000s most likely have had a profound impact on how the local regimes in Russian regions look like, yet, as Obydenkova and Libman (2012) show, the impact of regional democracy on behavior of Russian citizens and bureaucrats seems to be highly resilient.

Thus, we obtain a set of eight indicators (two published by the Ministry of Economic Development, four by Aleskerov et al. and two democracy indices) and insert them in our regressions one by one. The results remain entirely robust, particularly in the triple interaction case (where we find almost no shifts in the significance and size of the marginal effect). Hence, we can claim that our results are not driven by the overall efficiency or patriotism of local governments in Russia and are indeed associated with the differences in local knowledge of regional governors.

7.2. Alternative interpretation of the local origin variable

The approach we used so far is likely to rule out both the reverse causality (appointments determined by the forest fires) and omitted variable bias (both local origin and forest fires are determined by the same variable). However, it is still possible that the local origin and federal connections reflect a *different characteristic* of the governors other than the local knowledge and the presence of links to the federal government. Specifically, they may reflect governors' intelligence, organizational talents and other "soft skills". For instance, consider the case when "smarter" governors were aware of the advantages of federal connections in a highly centralized federation and therefore made their career choice accordingly. Then it is not clear whether better performance of the governors with background in federal bureaucracy is due to the presence of federal connections or to their intelligence, driving both federal connections and behavior during forest fires in the first place (some sort of self selection of individuals with higher qualifications into public service). The

same argument could be used with respect to the local origin. This problem will be discussed in what follows.

To start with, the situation is somewhat more straightforward in terms of the local origin. Our results indicate a higher quality of policies implemented by the governors with local origin. Thus, the only possible interpretation is that more "intelligent" governors ("intelligence" here stands for all other "soft skills" which could matter for a public official for simplicity) are more likely to stay in their region, while less "intelligent" work elsewhere. This is, however, inconsistent with the patterns of mobility in Russia. Russia is a highly hierarchical country not only in terms of its political system, but also in terms of the educational system and the economic structure. For instance, the best universities are located in the large metropolitan centers, with Moscow being the absolute leader in almost all disciplines (followed by St. Petersburg and Novosibirsk). Thus, for most regions of Russia it is the case that the more talented high school graduates enroll in the programs outside their regions, while the less talented stay in the region. Similar logic applies to the further professional life: more successful specialists migrate to Moscow, less successful stay in their region. After the graduation, the best students rarely attempt to return to their home regions, aspiring the career in the capital cities. Horizontal migration between centers of equal importance is less often. Thus, for almost all parts of Russia (with the exception of Moscow and St. Petersburg, which are excluded from our sample anyway) it is safe to say that the more "intelligent" are usually more likely to spend a substantial part of their career outside of their region. This, however, directly contradicts our findings, which imply better performance of those with "local origin".

The situation is different for the federal connections. In this case the hypothesis of self-selection into federal service requires more detailed discussion. Unfortunately, it is impossible to measure the governors` intelligence directly (e.g. school grades, IQ test etc.), so we have to devise indirect measures of their soft skills. However, there are three indirect tests which we can use; they are described in what follows.

Higher education: A possible indicator for the intelligence of a politician is the quality of his higher education and the reputation of the respective university. The governors in the sample have diverse educational backgrounds. While some graduated from the most distinguished Russian universities, others merely received some sort of vocational training. The problem is, of course, that some received their place at a prestigious university not because of personal talents or qualifications of any sort but rather because of connections of the parents; this type of informal connections play a large role in the Russian educational

system. Yet another problem is that prestige does not necessarily reflect the quality of training and the skills required to pass the program – while it is certainly the case for sciences and mathematics, in social sciences traditional Russian universities are often not very challenging. On the other hand, even if the program as such is not challenging, but the reputation of the school is high, it can still create a stimulating competitive atmosphere. Furthermore, prestige matters in terms of possible informal network formation, which may support the graduates in their future career and serve as yet another "hidden factor" influencing both the decision to join the federal public service and the success in managing the region. Therefore, in what follows we will primarily try to understand whether the governors studied at universities in terms of prestige.

For this purpose, we look at the educational institution in which the governor has studied (and graduated) subsequent to his school education (which typically falls in the age of 20-25)[39] and try to identify whether the respective university is among the top 30 Russian higher education institutions in terms of prestige in the country. Specifically, we base our analysis on the data of the Ranking Web of World Universities which includes 12,000 universities worldwide (450 Russian higher education institutions) and is based on an internet link analysis.[40] This ranking has two major advantages in comparison to other university rankings. First, if one looks at other international rankings (e.g. QS, or THE university rankings) one will hardly find any Russian university due to the relatively small sample size of the rankings.[41] Second, a purely Russian university ranking might possibly not be objective enough due to the informal linkages between universities and ranking agencies. The Ranking Web looks primarily on the Internet visibility of the universities, including not only their own "activity" in this respect, but also the overall attention to the university in the Internet. Clearly, it is not an objective measure of the university's quality: but it does reflect the prestige of the university (in fact, even if the most prestigious universities do not care about their Internet appearance, they will still be actively discussed in the Internet due to their status). Prestige is, however, what we want to capture. As a result we use a dummy variable which is one if the governor has graduated from a one of the 30 universities and 0 if

[39] We ignore any professional education and postgraduate degrees (e.g. PhDs), since we cannot definitely assume that the governors achieved the degree by their own accomplishment and not through informal support of his staff or even bribes.

[40] For more information on the methodology see http://www.webometrics.info/. The ranking is compiled by a research group of the CCHS (part of CSIS, the largest public research group in Spain) and is updated every six months. We use the ranking of July 2011. The list of universities is provided in *Appendix C.*

[41] Most of them include the Lomonosov University in Moscow, but not a single governor has studied at this university, according to our data.

otherwise.[42] We do not use the individual ranks of particular schools in ranking since, as mentioned, ranking is a rather crude measure, and it is necessary not to over-estimate the small differences within its scale.[43]

In addition, we also use another university ranking compiled by a Russian institution – the Higher School of Economics (one of the leading Russian universities located in Moscow). The ranking was published in 2010 and is based on the score of the students admitted to the universities in their entrance exam (which in Russia also serves as the final exam for high schools). We use exactly the same procedure (creating a dummy for 30 top universities). The caveats mentioned above apply to this ranking as well; yet by using a different (also possibly imperfect) ranking we still can partly evaluate the robustness of our results.[44]

We use the data obtained for two purposes. First, we check for self-selection bias by calculating a simple mean comparison between the governors who graduated from one of the "Top 30 universities" and from the "other universities". The results are reported in *Appendix F*. One can see that there is no significant difference between governors with federal connections and the rest of our sample in terms of the quality of education received, regardless of which ranking we use. However, the self-selection effect would imply that the governors with federal connections should be more likely to have graduated from prestigious universities. Second, we include the dummy for top 30 universities in our regression and check whether it affects the results. Here we also use two alternative dummy variables. First, we use a dummy for governors receiving education in Moscow or in St. Petersburg. These dummy does not rely on a rating of schools (which can of course be questionable) and rather assumes that most universities in the capital cities of Russia have an above average quality. Once again, this assumption is not flawless (there are many not so good schools in Moscow, which are clearly weaker than the universities in, say, Kazan or Novosibirsk). Nevertheless, universities in Moscow and St. Petersburg can be better as a platform for creating networks supporting the future career. There is one more alternative we investigate: a dummy equal to one for all governors, who studied outside of the region of their birth. The idea is, once again,

[42] Since most of the governors received their education during the Soviet period, the names of the universities changed between their graduation and the period the ranking was prepared. We have tried to adjust for that. Furthermore, the prestige of some schools changed a lot after the collapse of the USSR: for example, economics or legal studies gained at importance. We acknowledge this limitation, however, since there is no ranking of *Soviet* universities available, use the current data. We also took the possible mergers of universities into account. One governor in our sample graduated from a Ukrainian institution; for him the dummy is set to be equal to 0. Although the decision has not been made according to the ranking it fits the above described logic, as the respective governor studied in relatively unknown institution for vocational training.

[43] We should acknowledge that the reputation of universities partly changed significantly between the Soviet and the current period, and some governors received their education in the USSR. This is a caveat one has to accept, as there are no rankings of the Soviet period available.

[44] The list of universities is reported in *Appendix C* as well.

that in Russia (with the exception of Moscow and St. Petersburg) usually the "brighter" students study in a different region than that where they were born. However, the inclusion of these variables does not change our results; even for the triple interaction terms the results remain essentially the same.

Mobility: Another indicator for the personal characteristics of a governor contributing to his ability to effectively manage the affairs of his region might be his mobility. It is reasonable to assume that mobile individuals are more entrepreneurial and ambitious than those staying in a particular location for their entire life. In order to measure this proxy we count the number of regions in which the governor has worked before inauguration. Although the region of work and residence do not necessarily have to coincide, taking into consideration the size of many regions it is most likely. While counting the regions of employment we use the following assumptions. First, we count the first region of employment regardless whether the governor has graduated in that region. Second, we count the region of gubernatorial appointment if the governor has not worked in that region before. The consideration behind the first two rules is that normally the locality of the first employment cannot not easily choose (especially not in the Soviet Union), while later decisions, especially on career development and location of employment is more deliberately chosen. Third, if a governor had various, however discontinuous work engagement in one region, we only consider the regions once. Fourth, an employment abroad is counted as "additional region".[45] Fifth, governors who had a seat in the Federation Council or the State Duma are counted as work position in Moscow.

Once again, we implement a mean comparison attempting to find out whether the governors with federal connections are more likely to be mobile, and also use the mobility variable as one of the controls in the regressions. The results are reported in *Appendix G*. Unlike the education variable, we do find significant differences between regional governors with and without federal connections in terms of mobility: the former group usually has worked in a larger number of regions in the past. Partly it is endogenous to the already chosen path of a federal bureaucrat (clearly, a regional bureaucrat or politician is more likely to work in a particular region than an individual employed by the federal government). The effect also does not survive if one includes Moscow City and St. Petersburg in the sample. Nevertheless, most importantly, adding mobility variable to the set of covariates does not change the outcomes of our regressions. Thus, the results are once again confirmed: we find that local

[45] There is one governor who worked in several regions (oblast) of Ukraine. We count the positions in different Ukrainian regions separately (Ukraine is subdivided into 25 regions).

origin and federal connections affect the effectiveness of forest fires management *ceteris paribus* mobility of the governor in the past.

Career paths under Yeltsin: Finally, we also use an alternative approach to check for the possible self-selection into bureaucracy. The fact that the federal bureaucracy offers attractive career opportunities became clear under Putin. However, the situation was entirely different under Yeltsin, when business careers or jobs at regional administrations were more likely to be attractive. The ascension of Putin to power was extremely fast and unexpected (it suffices to say that after his appointment as prime minister in 1999 he had a one-digit popularity rating significantly below another possible candidate for the presidency, Evgeny Primakov). Therefore, it is almost impossible to expect an individual to anticipate this shift in the 1990s and adjust her career path accordingly. Therefore, we checked for the work experience of governors with federal connections in the 1990s. If there was a "self-selection" of more talented and clever individuals into the federal service going on, one should expect all of them to have worked *outside* the federal administration in the 1990s, and join it in the 2000s, when the career options became evident. On the other hand, if a substantial fraction of these individuals worked for the federal government already in the 1990s, the self-selection becomes less likely. In our sample the career paths of the governors differed substantially: but we still find that 46% of the governors with federal connections entered the federal public service *before* 2000 (and even before 1999, when Putin became prime minister). 20% have worked for the regional governments and served in regional parliaments, 26% in private sector, and the rest in the military. Hence, there is very little evidence of self-selection going on, and the interpretation of the federal connections dummy used in this paper seems to be confirmed.

8. Conclusion

The aim of this paper was to investigate the influence of the local knowledge advantage on the performance of sub-national governments. While this claim is of essential importance for the literature on fiscal federalism, it has rarely been tested empirically before. Our approach to identifying the local knowledge effect was based on two specific features. First, we looked at the variation of biographies and career paths of regional governors, attempting to find out the variation of local knowledge *within a federation* across different regions to isolate the effect of local knowledge from other possible effects of the construction of fiscal federalism. Specifically, we claimed that the governors with *local origin,* ruling the regions where they have spent their previous life, are more likely to possess local knowledge

than outsiders. Second, since the effect of the local origin on regional performance is subject to reverse causality and omitted variable bias, we examined the impact of local origin in a natural experiment setting. For this purpose we studied the effectiveness of Russian regional governors in combating forest fires in 2010 in the Russian Federation. We also took the specifics of the Russian centralized federalism into account, controlling for yet another characteristic of governors – the extent of the federal connections, allowing them to get access to federal resources.

Our findings confirm the existence of local knowledge advantage, but with several reservations. Overall, in our sample, the governors with high level of local knowledge and federal connections clearly outperformed their counterparts. One can expect the federal connections to be necessary to ensure the access to federal resources, and the local knowledge to guarantee that the resources are used in the region in a reasonable and efficient way. Local knowledge as such, however, does not have a positive impact on the performance of the governors. In some modifications we were even able to show that governors with high level of local origin and *absent* federal connections perform *worse* than the rest of our sample: we claim that outcome is due to the policies of the federal government treating the "entrenched" regional governors with suspicion and restricting their access to the resources. While the presence of federal connections "overcomes" this problem, otherwise governors are better off if they lack both federal connections *and* local origin. The results are robust to various specifications and estimation methods; we have investigated some alternative interpretations and sources of omitted variable bias and found the "local knowledge" interpretation of the "local origin" variable to be the most plausible one.

Thus, it is possible to conclude that the local knowledge *does* matter for the performance of the regional governors. However, in a centralized federation, where resources are primarily distributed from the central government, local knowledge advantage can be realized only if regional politicians have access to the federal-level decision-making as well.

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Appendix A: The local origin index (a detailed account)

A1. Method

The local origin index measures the relative period a governors has spend in his region of office before inauguration. For this purpose we determine the governor's duration of residency and calculate the age at taking office. The ratio of the length of stay to the inauguration age yields the degree of local origin. Essential for this kind of calculation is an extensive analysis of biographical information data. We have utilized the data from publicly available biographies of all Russian governors and extracted information on the place of birth (also serves as a proxy for adolescence), institution of higher education and professional career path. For the three stages of life we determine the date and geographical region (in terms of the 83 Russian regions, only regions no city). The three phases of life contribute to the degree of local origin and can be related to different aspects of local knowledge. Thus, in the childhood and adolescence years one encounters moral beliefs and traditions. In the education phase one is able to set up and expand a network of regional contacts, while during the professional career one is confronted with specific regional problems. We are aware of the fact that by assessing a relative and pre-inauguration local origin score we face some problem. A relatively young governor with a score who has spent his entire life in his region of office might receive the same local origin score, as someone who has "crowned" his political career with gubernatorial office. Furthermore, a governor who has been appointed recently may behave differently as a governor who has already 20 years of gubernatorial experience. However, we want to differentiate different sources of local knowledge by looking separately on local origin, tenure, and age.

A2. Assumptions

When analyzing the governor's pre-inauguration biographies and calculation the length of residence in the region of office we make a number of assumptions and corrections. First of all, we are aware of the fact that only looking at the place of birth as a proxy of childhood and adolescence is not sufficient. Since it is possible that a governor might have moved to another region within this first phase of life, we check for any inter-regional mobility within the first 18 years and when necessary correct our estimations accordingly. Second, we assume a period of five year of education when the governor has studied in university. This assumption is unavoidable, as most biographies indicate only the year of graduation and omit the year of enrollment. We have adopted this assumption for governors who have only completed secondary education, studied on a part-time basis, or prolonged their education by a subsequent PhD degree. However, we consider only the places of higher education which were completed. Third, we neglect military service in our calculations. All governors, regardless whether during Soviet or post-Soviet times were required to serve 2 years in the armed forces. Most governors completed their military service either before, or directly after their university studies. However, most biographies do not specify in which regions the governors were stationed. We adopt this assumption for governors who made their professional career in the army. Fourth, in cases were the governor has made a career as businessmen his place of residence is not always specified. For these cases we assume the headquarter of the company to be place of residence. For small regional companies this assumption is unproblematic as locality of business operations and management coincide. For large inter-regional companies (which headquarter is always in Moscow city) we made a justified judgment.

A3. Classification

A governor who has spend over 70% of his life in his region of office is considered to have a high level of local origin (score 4). A governors who has lived between 20-70% of his lifespan in their region of office is considered to have intermediate level of local origin (score 3). The last group of governors spends only 20% or less for their life in their region of office. These are governors who made a rapid career in the region (within a few years) and external politicians who have been appointed by Putin/Medvedev. To account for the heterogeneity of the Russian Federation the last group is additionally subdivided between governors who originate from close by regions (score 2) and governors from distant region (score 1). As a measure of distance we use the federal district classification. If the governor originates from a region within the same federal district he receives a score of 2 if he originates from a region of a different federal district he receives a score of 1.

A4. Example

For illustrative reasons we have set up a document which presents the necessary and used biographical data in order to calculate the local origin index. The data is presented for the specific of example of Belgorod region, in the Western part of Russian (Central federal district) bordering Ukraine. Notice, that geographical units which are specified in brackets refer to the respective region (administrative names such as republic, krai, or okurg are omitted). The governor of Belgorod region, Yevgeny Savchenko, was born, raised, and educated in Belgorod region (primary and vocational education). After he completed his higher education in Moscow cit, he moved back to Belgorod where he worked until the dissolution of the Soviet Union. Before he was appointed by Yeltsin he spend three years in the in the ministry of agriculture and production of the Russian federation. In

total we estimate that he spend 35 of his 43 pre-inauguration years in Belgorod (81%) which qualify him for the highest local origin score of 4.

1. Region: Belgorod
Governor: Yevgeny Savchenko
In office since 1993

Date of birth: 1950 (Belgorod)
Education: Moscow academy of agriculture, 1976 (Moscow city)

Career stages:
1976-1990, collective farm, state farm, district administration (Belgorod)
1990-1993, ministry of agriculture and production (Moscow city)

Inauguration age: 43
Years spend in his region: 35
Years spend outside his region: 8
Share of years spend in the region: 81%

Local origin index: 4
Local origin dummy: 1
Federal connection dummy: 0

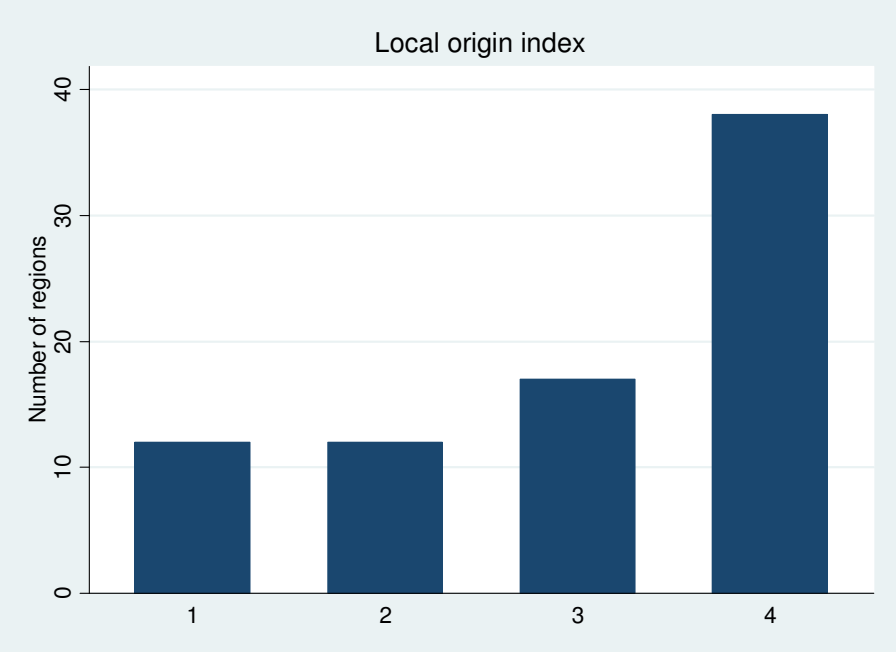
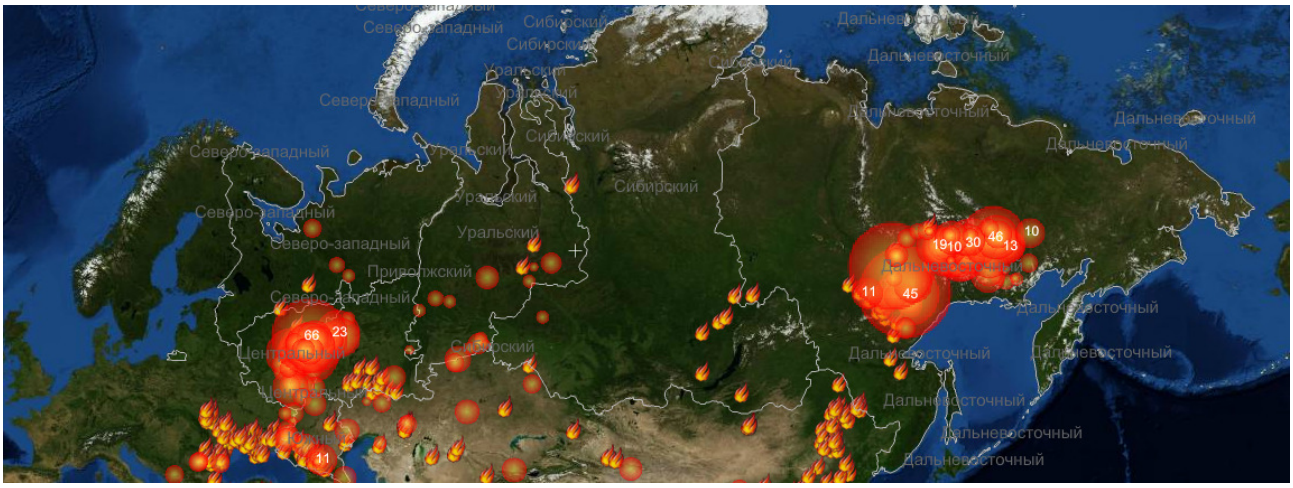


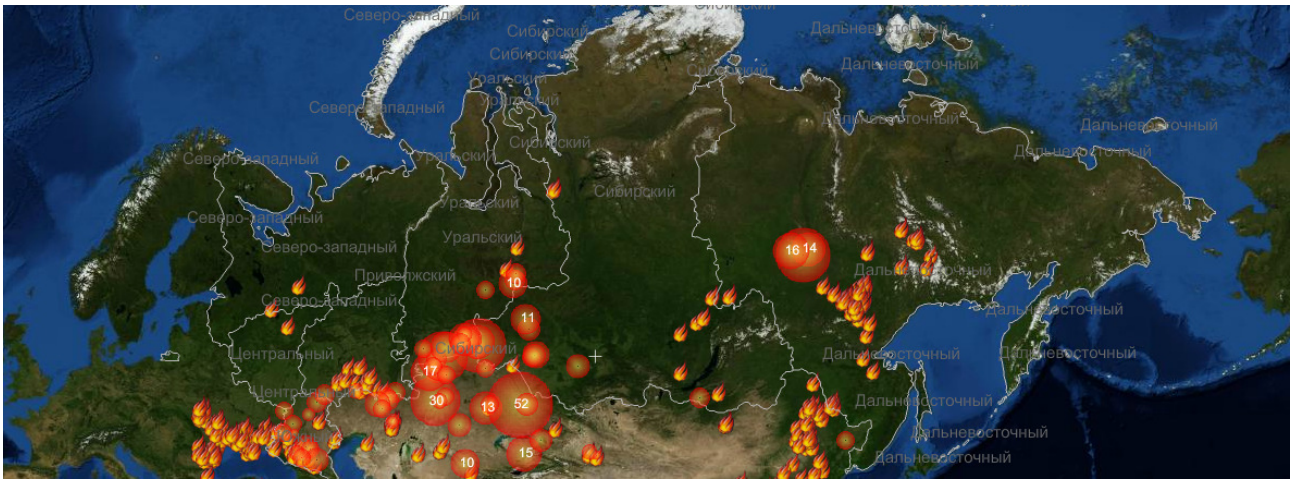
Figure A1: Distribution of regions according to the value of the local origin variable

Appendix B: The spatial expansion of wildfires

Cosmic forest fire monitoring (29.07.2010)



Cosmic forest fire monitoring (31.08.2010)



Source: “Kosmosnimki forest fire monitoring” (http://fires.kosmosnimki.ru/)

Appendix C: University rankings

Table C1: Moscow Higher School of Economics: Russian University ranking (2010)

	University	Average score unified state examination	Minimum score unified state examination	Accepted students on budget places	Accepted price winners on budget places
1	Moscow Institute of Physics and Technology	86.3	77.7	784	47
2	Moscow State Institute of International Relations	85.8	82.1	444	83
3	Moscow Architectural Institute	83	64.5	175	0
4	National Research University Higher School of Economics	82.88	80.9	1426	733
5	Finance University under the Government of the Russian Federation	82.2	77.3	641	110
6	Moscow State University	81.6	72.8	3883	701
7	All-Russian Academy of Foreign Trade	80.2	72.2	175	0
8	Gubkin Russian State University of Oil and Gas	77.6	70.6	616	0
9	Moscow State Linguistic University	76.9	67.1	662	3
10	Moscow State University of Economics, Statistics, and Informatics	76.8	72.6	448	8
11	Russian Presidential Academy of National Economy and Public Administration	76.8	67.5	290	7
12	Plekhanov Russian Economic University	76.8	64.1	778	35
13	Saint Petersburg State University of Economics and Finance	76.6	71.5	620	265
14	Saint Petersburg State University	76.6	68.9	2721	719
15	Saint Petersburg State University of Engineering and Economics	75.2	71.8	289	0
16	Moscow Engineering Physics Institute (National Research Nuclear University)	75	63.6	1189	10
17	Moscow State Law Academy	74.6	46.9	453	1
18	Linguistics University of Nizhny Novgorod	74.1	66.1	189	2
19	Russian State University for the Humanities	74	67.7	739	140
20	Novosibirsk State University	73.3	70.8	820	0
21	Ufa State Petroleum Technological University	73.2	65.6	887	0
22	The Budget and Treasury Academy of the Ministry of Finance of the Russian Federation	72.8	68.2	388	0
23	Moscow State University of Civil Engineering	72.7	47.1	876	1
24	Saratov State Socio Economic University	72	70.2	307	1
25	The State University of Management	71.9	65.4	859	0
26	Saint Petersburg State Polytechnic University	71.7	64.9	2003	337
27	Saint-Petersburg State University of Architecture and Civil Engineering	71.1	66.1	746	0
28	Perm State University	71	67.9	849	0
29	Ural State University	70.8	69.6	873	53
30	Peoples' Friendship University of Russia	70.2	64.7	628	46

Source: http://www.forbes.ru

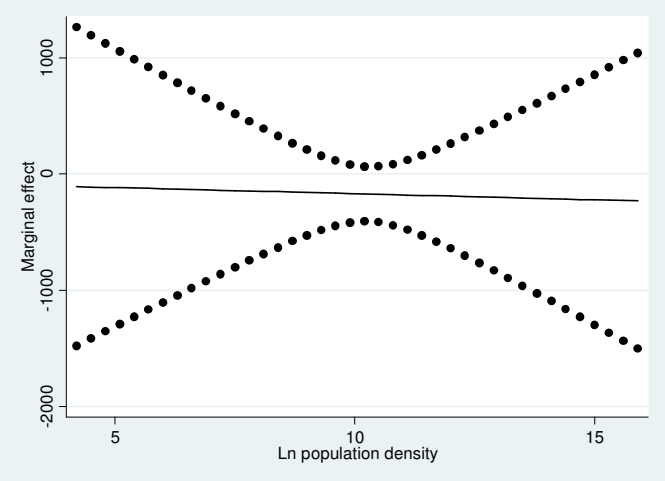
Table C2: Ranking Web of World Universities: Russian university ranking (2010)

	World rank	University	Size	Visibility	Rich files	Scholars
1	304	Lomonosov Moscow State University	232	547	175	125
2	883	Kazan State University	1113	991	633	589
3	899	State University Higher School of Economics	513	984	549	1842
4	1002	Saint Petersburg State University	863	1526	456	401
5	1031	Tomsk State University	1135	1157	1172	402
6	1059	Novosibirsk State University	828	1552	751	965
7	1145	Tomsk Polytechnic University	1256	3721	813	520
8	1194	Moscow Institute of Physics and Technology	632	1631	1765	1202
9	1206	Ural State University	1753	3111	934	688
10	1208	Saint Petersburg State Institute of Fine Mechanics and Optics	1273	2818	963	974
11	1245	Southern Federal University (Rostov State University)	1249	3433	1357	683
12	1248	Saratov State University	1330	2866	1628	633
13	1293	Lobachevsky State University of Nizhny Novgorod	1785	4317	1052	649
14	1344	Moscow State Engineering Physics Institute	2421	2866	1396	830
15	1351	Peoples' Friendship University of Russia	1695	2032	1926	1103
16	1368	Voronezh State University	2486	4618	1322	508
17	1393	Siberian Federal University	1284	3111	1428	1280
18	1469	Bauman Moscow State Technical University	1666	2331	1766	1502
19	1582	Novosibirsk State Technical University	1212	4761	1460	1535
20	1632	Moscow State Institute of International Relations	1487	1713	1449	2108
21	1650	Altai State University	1185	4139	1127	1821
22	1696	Saint Petersburg State Polytechnic University	2928	4277	2663	1004
23	1733	Ural State Technical University	2921	4277	2809	1008
24	1976	Udmurt State University	2208	3768	1690	1863
25	2029	Ulyanovsk State Technical University	2492	3323	1980	1863
26	2120	Tambov State Technical University	2917	4421	1417	1931
27	2168	Russian Academy of State Administration	1760	3251	2084	2297
28	2272	Moscow Power Engineering Institute	2502	6016	2991	1575
29	2280	Russian State University for the Humanities	1645	2178	2767	3063
30	2316	Russian State Pedagogical University AI Herzen	5031	3368	2627	1710

Source: http://www.webometrics.info

Appendix D: Population density and population instead of urbanization

Figure D1: Marginal effect of federal connections on monitoring effectiveness conditional on the population density for different levels of local origin, triple interaction term



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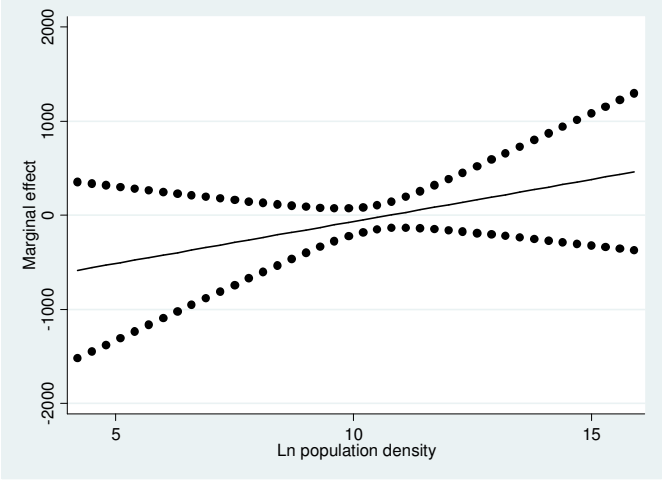

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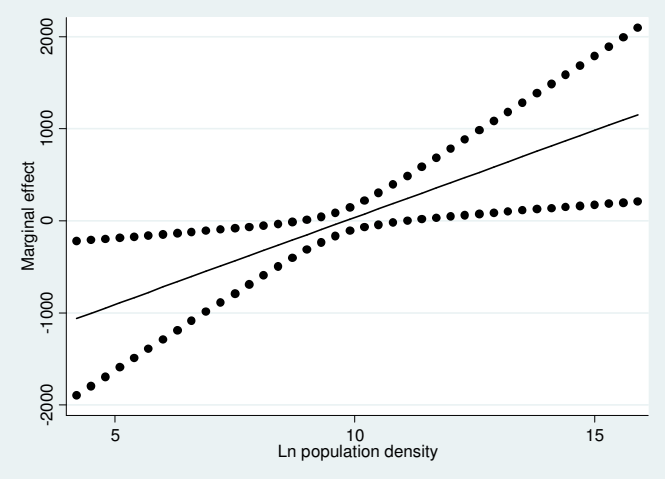
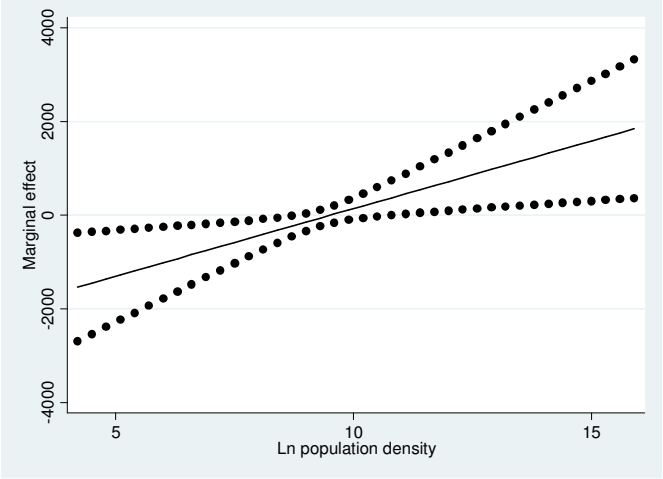


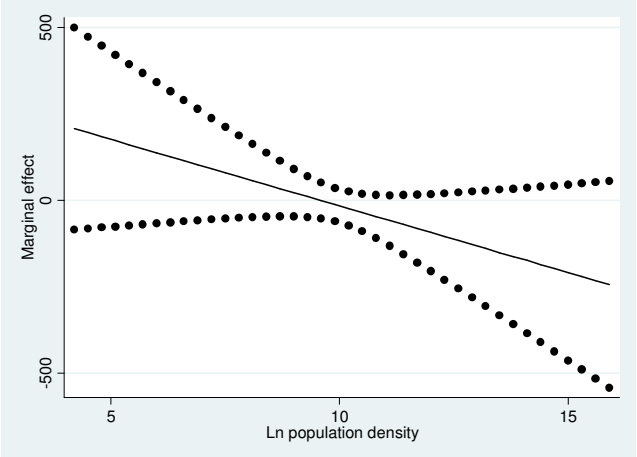
Local origin = 3



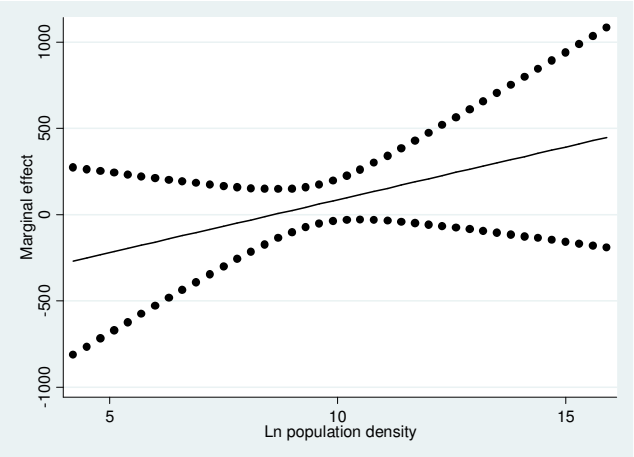
Local origin = 4

Note: 90% confidence intervals are used

Figure D2: Marginal effect of local origin on monitoring effectiveness conditional on the population density for different levels of federal connections, triple interaction term



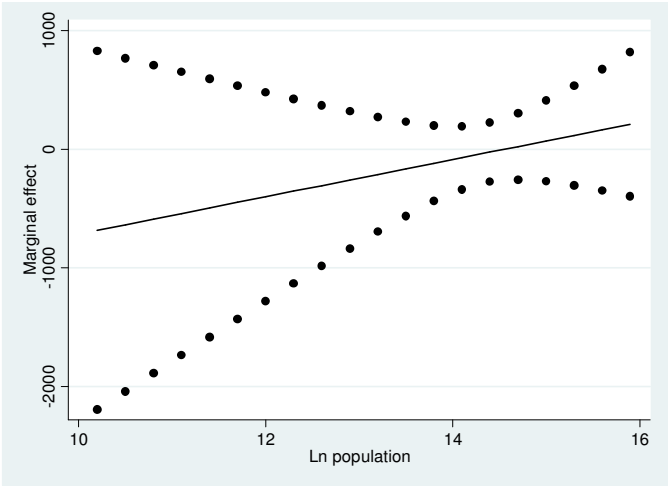
Federal connections = 0



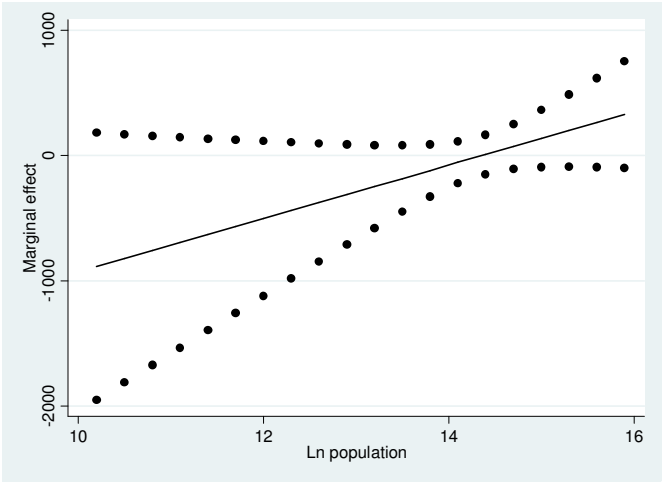
Federal connections = 1

Note: 90% confidence intervals are used

Figure D3: Marginal effect of federal connections on monitoring effectiveness conditional on the size of the population for different levels of local origin, triple interaction term



Local origin = 1



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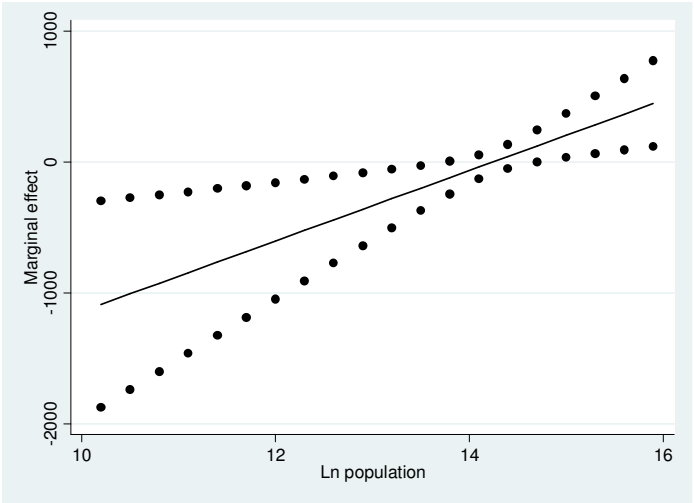

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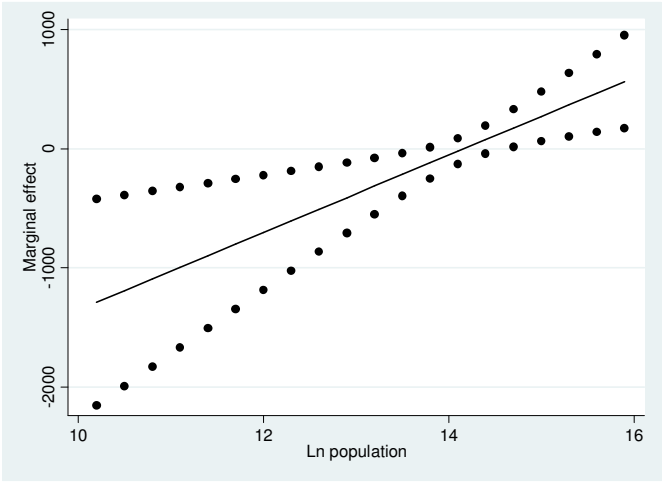
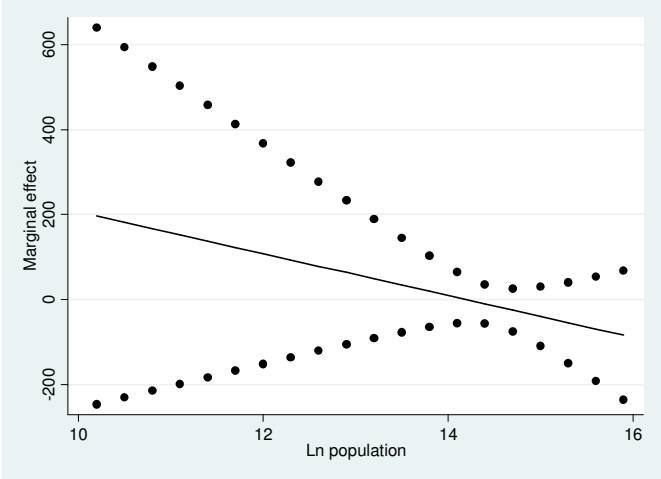


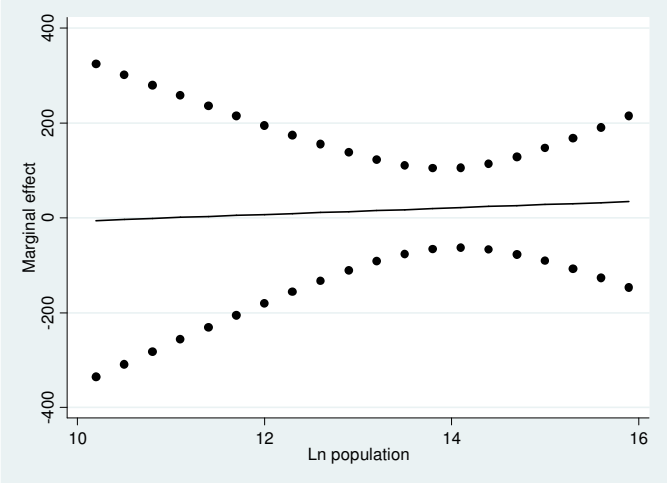
Local origin = 4

Note: 90% confidence intervals are used

Figure D4: Marginal effect of local origin on monitoring effectiveness conditional on the size of the population for different levels of federal connections, triple interaction term



Federal connections = 0



Federal connections = 1

Note: 90% confidence intervals are used

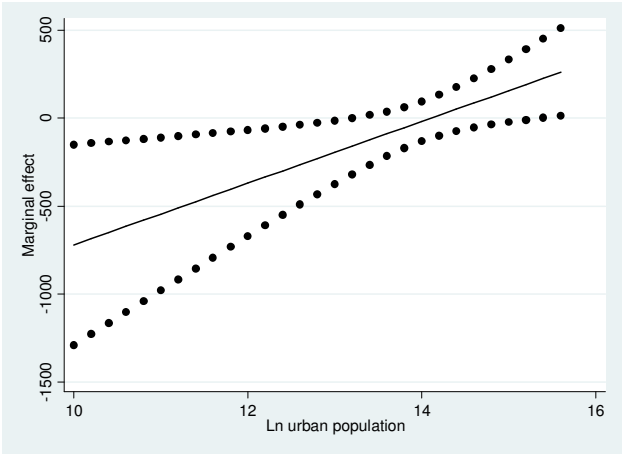
Appendix E: Binary local origin variable

Table E1: Impact of local origin and federal connections on forest fire monitoring effectiveness in 2010; dep. var.: forest area covered by fire divided by the number of reported fires; binary local origin

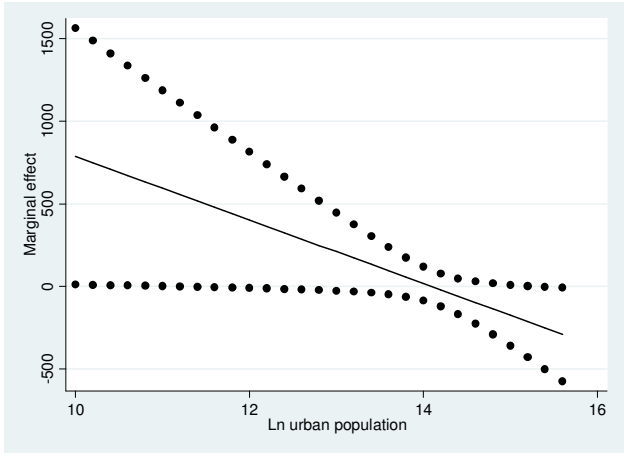
	OLS (E1)	OLS (E2)	OLS (E3)	OLS (E4)	OLS (E5)	OLS (E6)
Log area	**97.870****	**89.119****	**95.090****	**95.780****	**100.119****	**102.579*****
	(39.19)	**(38.07)**	**(37.86)**	**(39.48)**	**(38.68)**	**(37.97)**
Share of forest	**-6.312*****	**-6.216*****	**-5.954*****	**-6.429*****	**-6.237*****	**-5.853*****
	(2.31)	**(2.29)**	**(2.12)**	**(2.34)**	**(2.20)**	**(2.10)**
Temperature	**-71.446****	**-75.790****	**-69.676****	**-70.560****	**-61.899****	**-59.117****
	(31.74)	**(32.47)**	**(30.27)**	**(31.13)**	**(28.67)**	**(28.18)**
Rain	-2.42	-2.348	-2.118	-2.044	-1.339	-1.357
	(2.47)	(2.53)	(2.57)	(2.51)	(2.46)	(2.61)
Forestry expenditure	-2.055	-1.722	-1.916	-1.73	-1.97	**-2.198***
	(1.28)	(1.46)	(1.19)	(1.49)	(1.28)	**(1.19)**
Log urban population	-100.784	-94.613	48.657	**-106.487***	**-161.210****	-10.828
	(63.13)	(61.18)	(66.80)	**(63.35)**	**(78.54)**	(89.73)
Local origin		80.035	**2,711.485***			2,637.84
		(82.90)	**(1,569.34)**			(1,682.67)
Log urban population*local origin			**-192.452***			-189.763
			(110.74)			(118.94)
Federal connections				-89.259	**-2,472.785****	-2,330.41
				(87.34)	**(1,171.17)**	(1,503.56)
Log urban populationn* federal connections					**175.297****	169.35
					(83.46)	(107.71)
Constant	**2,795.266****	**2,761.659****	638.943	**2,855.739****	**3,374.216****	1,203.79
	(1,182.35)	**(1,165.17)**	(1,028.98)	**(1,194.20)**	**(1,318.78)**	(1,322.88)
Observations	71	71	71	71	71	71
R^2	0.422	0.429	0.455	0.428	0.451	0.475

Note: see Table 1

Figure E1: Marginal effect of federal connections and local origin on monitoring effectiveness conditional on the size of urban population, interaction terms, binary local origin



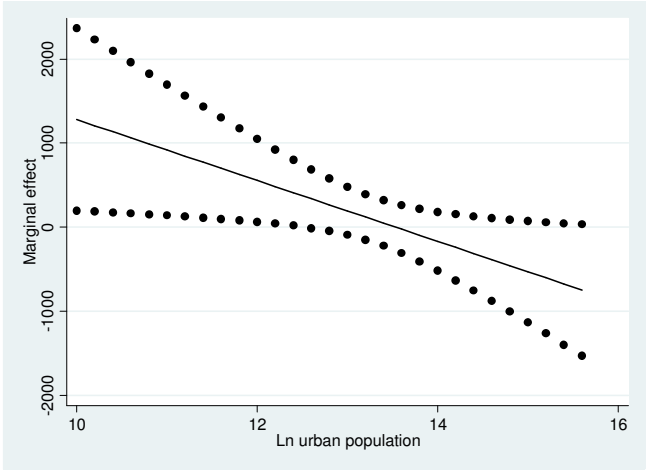
Marginal effects of federal connections



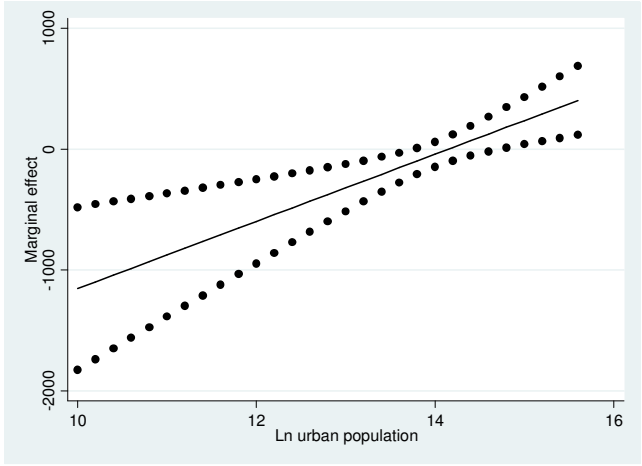
Marginal effects of local origin

Note: 90% confidence intervals are used

Figure E2: Marginal effect of federal connections on monitoring effectiveness conditional on the size of urban population for different levels of local origin, triple interaction term, binary local origin



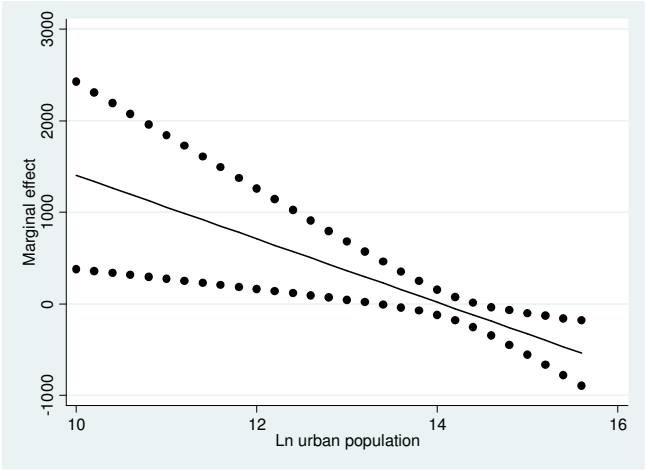
Local origin = 0



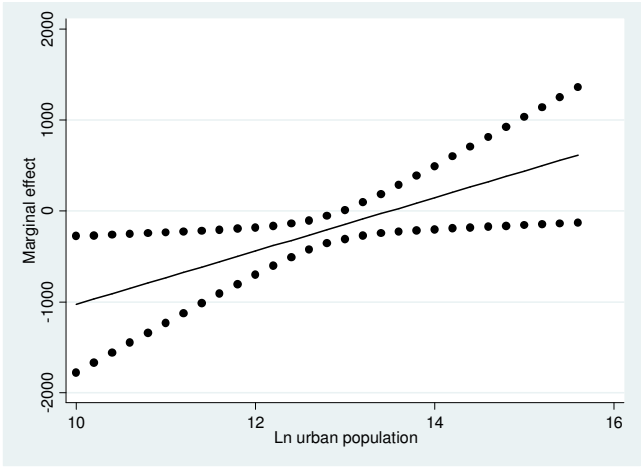
Local origin = 1

Note: 90% confidence intervals are used

Figure E3: Marginal effect of local origin on monitoring effectiveness conditional on the size of urban population for different levels of federal connections, triple interaction term, binary local origin



Federal connections = 0



Federal connections = 1

Note: 90% confidence intervals are used

Appendix F: Impact of educational background of governors on their performance

Table F1: Federal connection and forest monitoring, difference of means between the governors with top 50 university education and other universities

Variable	Ranking Web	Other universities	Difference
Federal connections	0.181 No.obs.: 11	0.273 No.obs.: 66	-0.091 t-stat: -0.6979 p-val: 0.4874
Monitoring effectiveness (dependent variable)	15.994 No.obs.: 11	134.999 No.obs.: 66	119.005 t-stat: 0.8456 p-val: 0.4005

Variable	Ranking HSE	Other universities	Difference
Federal connections	0.1 No.obs.: 10	0.209 No.obs.: 67	0.109 t-stat: 0.8043 p-val: 0.4237
Monitoring effectiveness (dependent variable)	37.436 No.obs.: 10	130.022 No.obs.: 67	92.586 t-stat: 0.6307 p-val: 0.5302

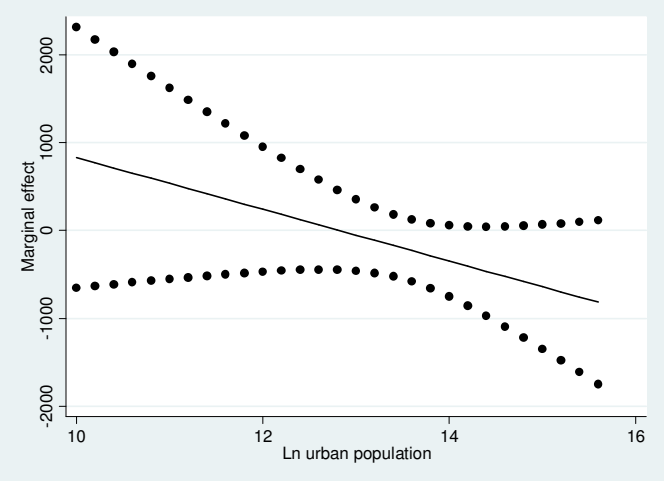
Notes: All regions, excluding autonomous okrugs and Moscow City and St. Petersburg City are used

Table F2: Impact of local origin and federal connections on forest fire monitoring effectiveness in 2010; dep. var.: forest area covered by fire divided by the number of reported fires, controlling for educational background of the governors

	OLS (F1)	**OLS (F2)**	**OLS (F3)**	**OLS (F4)**	**OLS (F5)**
Log area	**100.760****	**105.094*****	**100.295****	**83.435****	**99.952****
	(39.71)	**(39.15)**	**(40.16)**	**(37.06)**	**(40.27)**
Share of forest	**-6.254*****	**-6.619*****	**-5.929*****	**-5.788*****	**-6.158*****
	(2.22)	**(2.22)**	**(2.08)**	**(2.12)**	**(2.18)**
Temperature	**-62.097****	**-62.594****	**-61.963****	**-67.898****	**-64.494****
	(28.01)	**(28.14)**	**(28.17)**	**(29.78)**	**(30.75)**
Rain	-1.312	-1.19	-1.48	-1.988	-1.669
	(2.51)	(2.50)	(2.55)	(2.64)	(2.89)
Forestry expenditure	-2.021	**-2.313***	-1.922	-1.176	-1.992
	(1.29)	**(1.30)**	(1.26)	(1.22)	(1.35)
Log urban population	-128.537	-117.22	-127.637	-118.379	-112.93
	(155.72)	(149.54)	(156.62)	(146.82)	(156.13)
Local origin	151.732	209.36	154.447	136.861	196.795
	(663.28)	(622.06)	(658.09)	(625.85)	(677.74)
Log urban population*local origin	-10.973	-15.467	-11.13	-11.009	-14.698
	(46.89)	(43.80)	(46.43)	(44.47)	(48.07)
Federal connections	**-2,535.280***	**-2,279.765***	**-2,532.438***	**-2,685.340****	**-2,549.356***
	(1,290.07)	**(1,142.46)**	**(1,277.31)**	**(1,294.03)**	**(1,345.72)**
Log urban population* federal connections	**180.312***	**163.274***	**179.318***	**191.275****	**182.227***
	(92.49)	**(82.23)**	**(91.33)**	**(92.61)**	**(96.79)**
Web university ranking		**-195.452****			
		(91.51)			
HSE university ranking			-83.917		
			(113.57)		
Studied in Moscow or St. Petersburg				-117.356	
				(84.78)	
Studied in a different region from birth					-63.154
					(113.17)
Constant	2,920.770	2,795.340	2,916.430	3,071.040	2,826.410
	(2,378.71)	(2,300.50)	(2,395.14)	(2,250.07)	(2,364.14)
Observations	71	71	71	71	71
R^2	0.451	0.471	0.454	0.462	0.455

Note: see Table 1. Regression (F1) is identical to the baseline regression (6) to demonstrate the robustness of effects in terms of sign *and* magnitude

Figure F1: Marginal effect of federal connections on monitoring effectiveness conditional on the size of urban population for different levels of local origin, triple interaction term, controlling for dummy top 30 universities (Web ranking)



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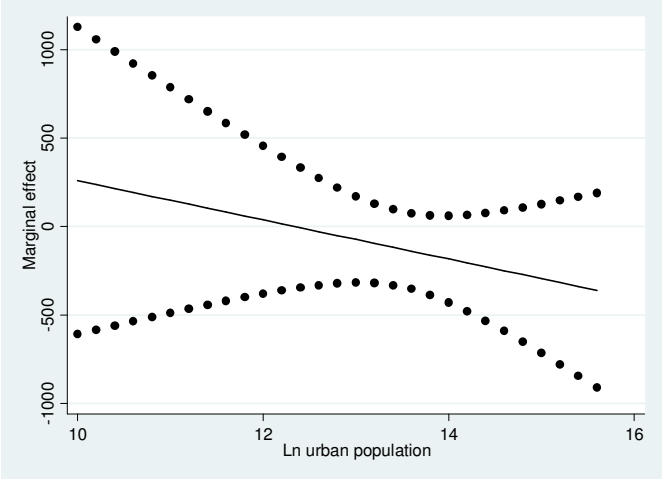

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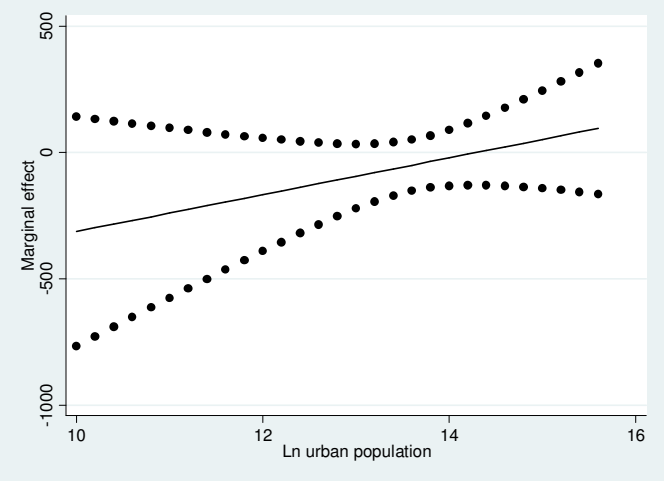

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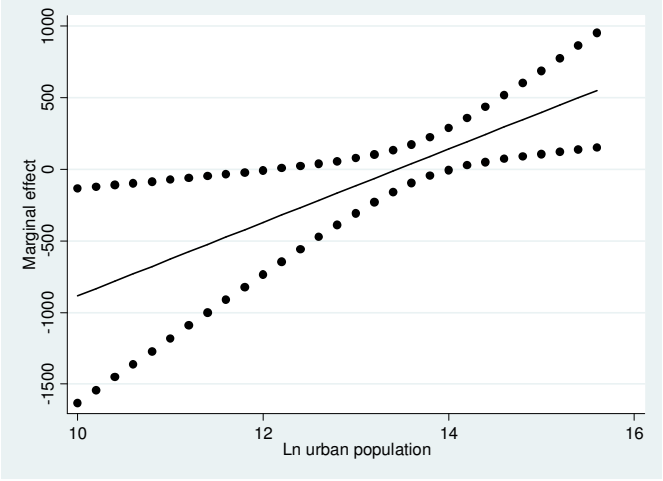
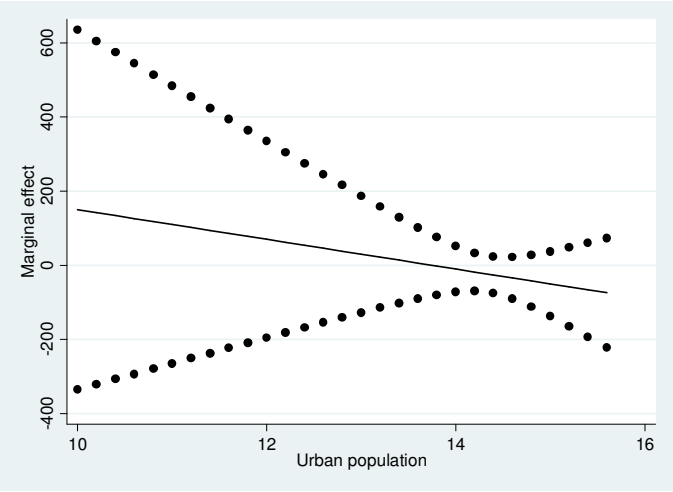


Local origin = 4

Note: 90% confidence intervals are used

Figure F2: Marginal effect of local origin on monitoring effectiveness conditional on the size of urban population for different levels of federal connections, triple interaction term, controlling for dummy top 30 universities (Web ranking)



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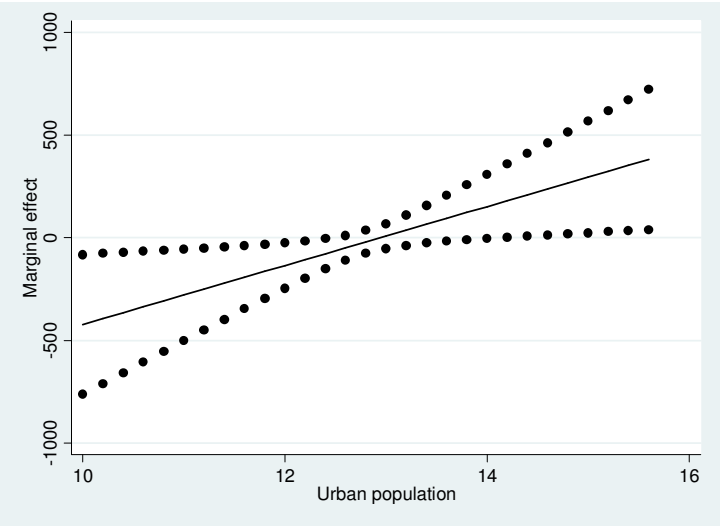
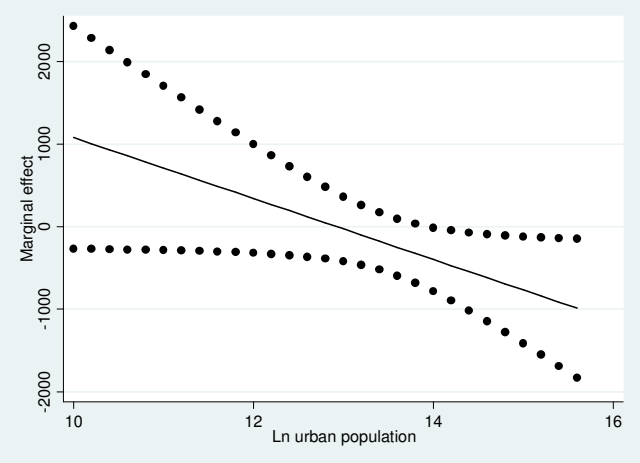


Federal connections = 1

Note: 90% confidence intervals are used

Figure F3: Marginal effect of federal connections on monitoring effectiveness conditional on the size of urban population for different levels of local origin, triple interaction term, controlling for dummy top 30 universities, HSE ranking



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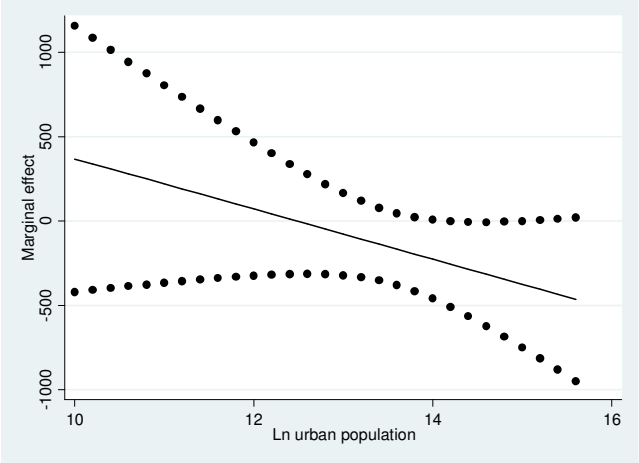

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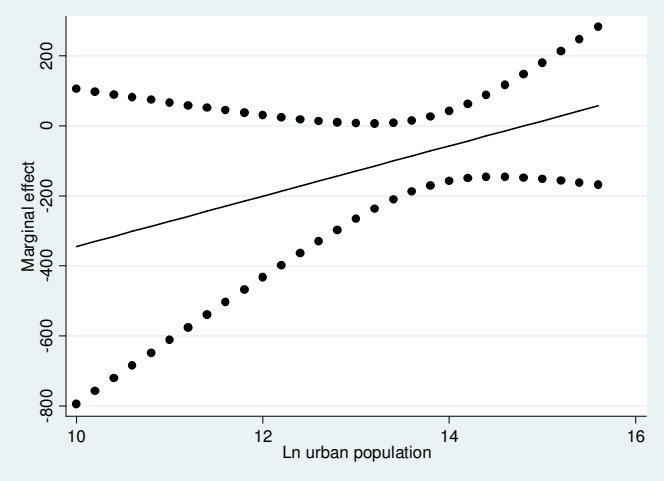

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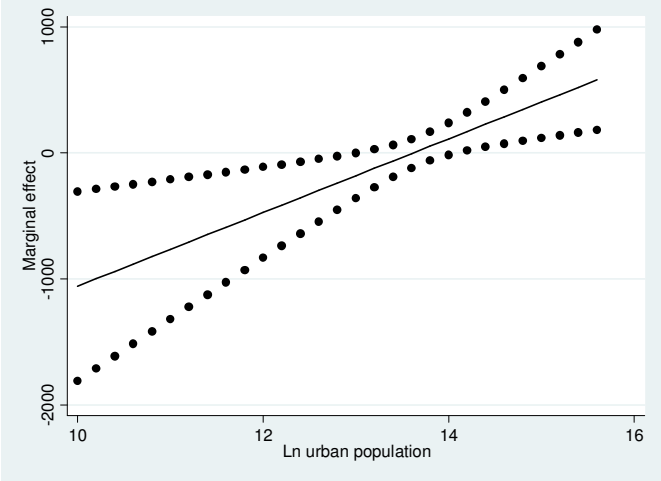
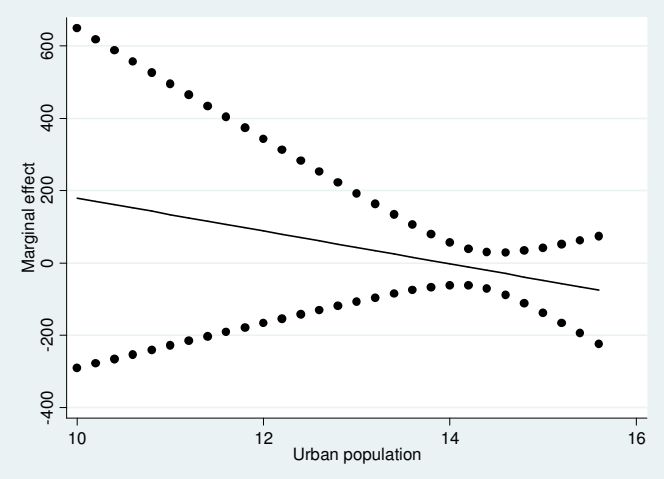


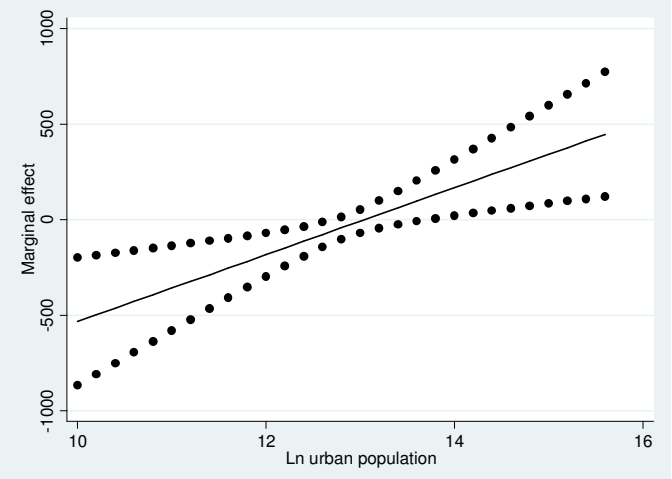
Local origin = 4

Note: 90% confidence intervals are used

Figure F4: Marginal effect of local origin on monitoring effectiveness conditional on the size of urban population for different levels of federal connections, triple interaction term, controlling for dummy top 30 universities, HSE ranking



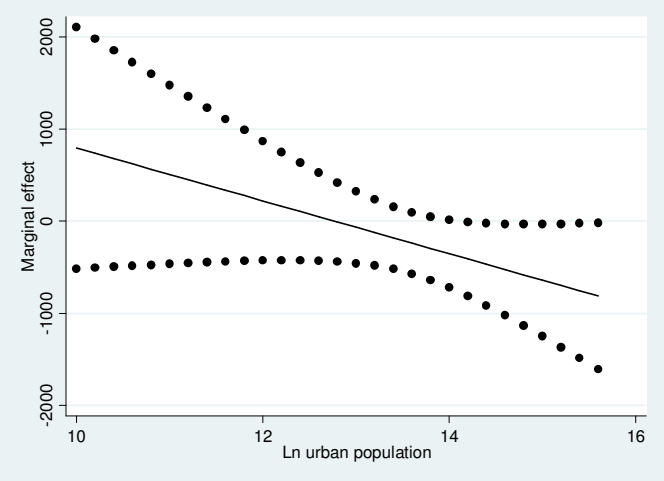
Federal connections = 0



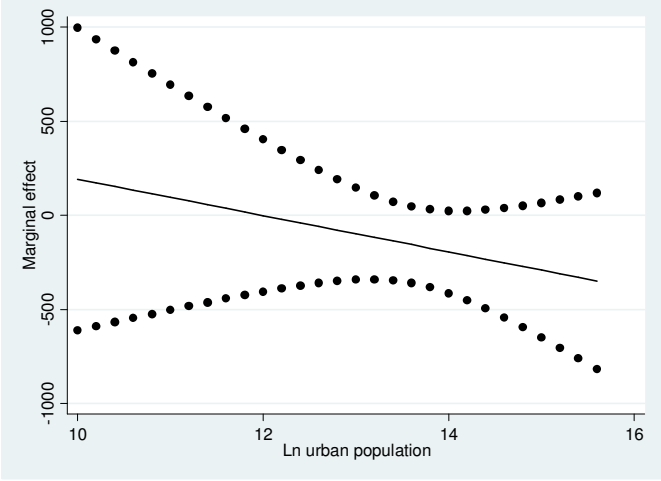
Federal connections = 1

Note: 90% confidence intervals are used

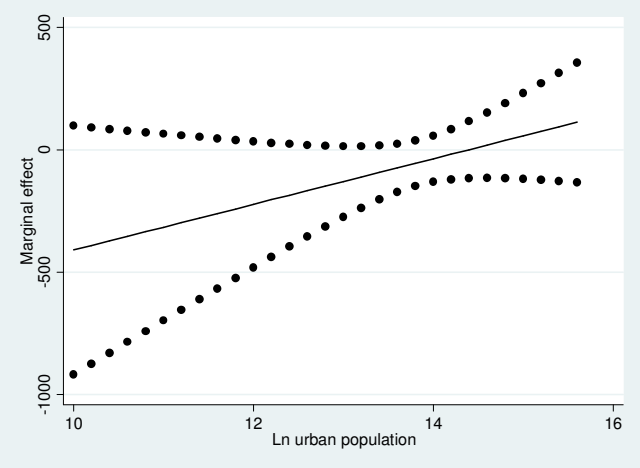
Figure F5: Marginal effect of federal connections on monitoring effectiveness conditional on the size of urban population for different levels of local origin, triple interaction term, controlling for dummy education in Moscow and St Petersburg



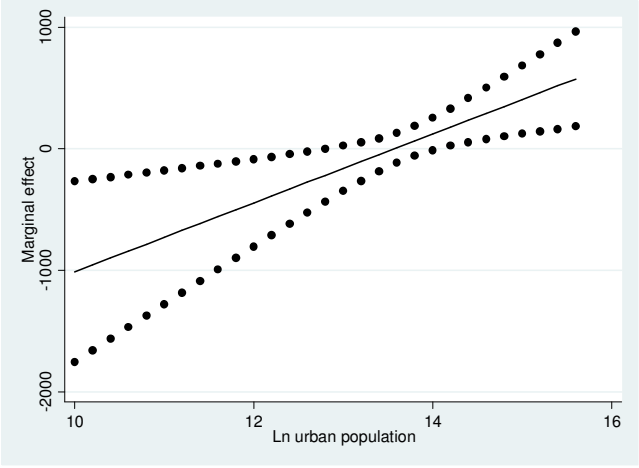
Local origin = 1



Local origin = 2



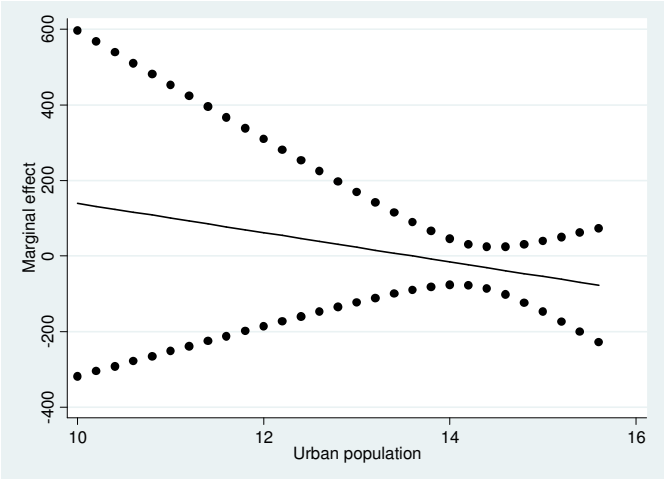
Local origin = 3



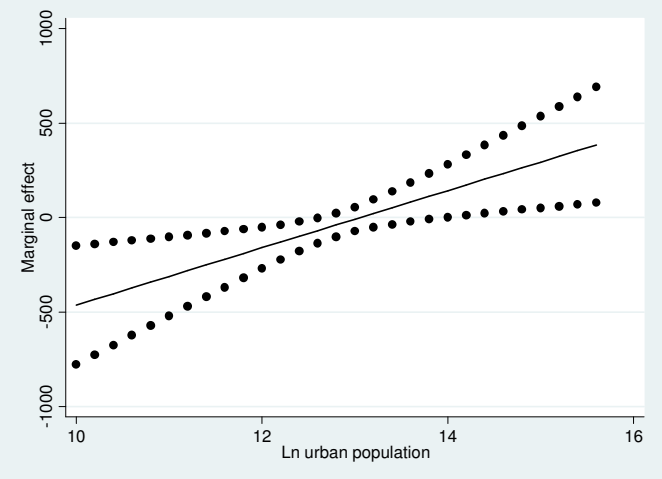
Local origin = 4

Note: 90% confidence intervals are used

Figure F6: Marginal effect of local origin on monitoring effectiveness conditional on the size of urban population for different levels of federal connections, triple interaction term, controlling for dummy education in Moscow and St Petersburg



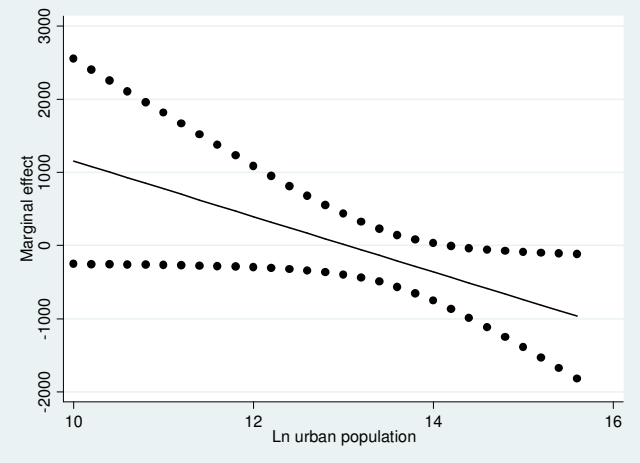
Federal connections = 0



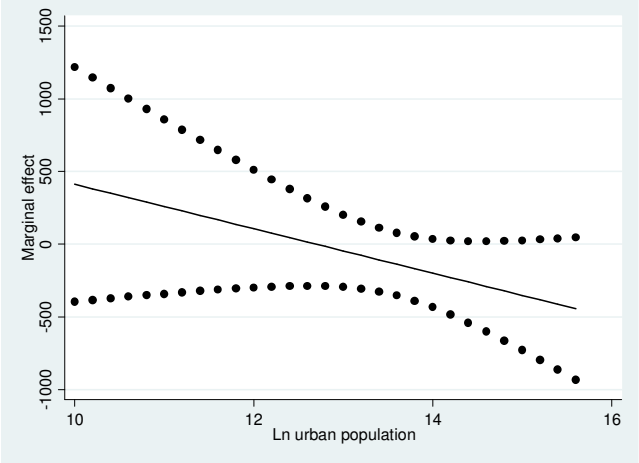
Federal connections = 1

Note: 90% confidence intervals are used

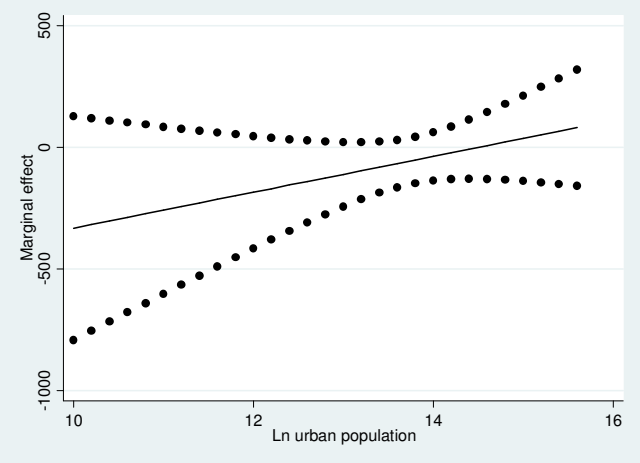
Figure F7: Marginal effect of federal connections on monitoring effectiveness conditional on the size of urban population for different levels of local origin, triple interaction term, controlling for dummy education in a different region from birth



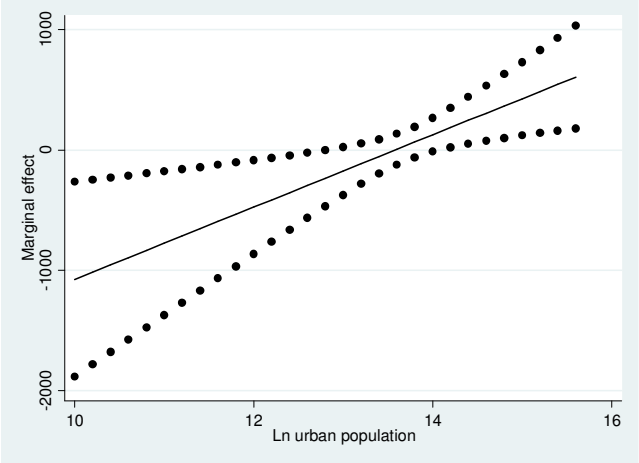
Local origin = 1



Local origin = 2



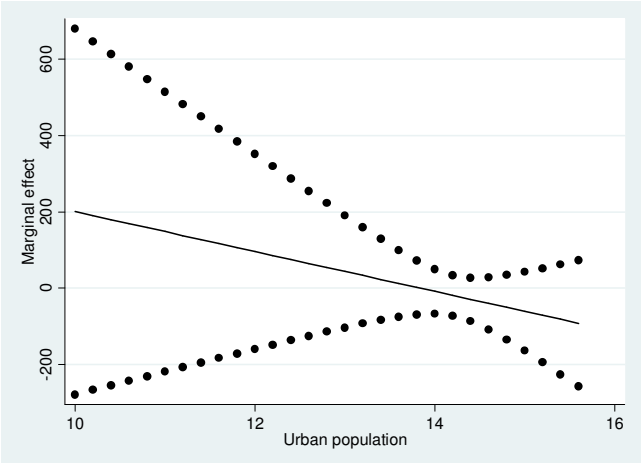
Local origin = 3



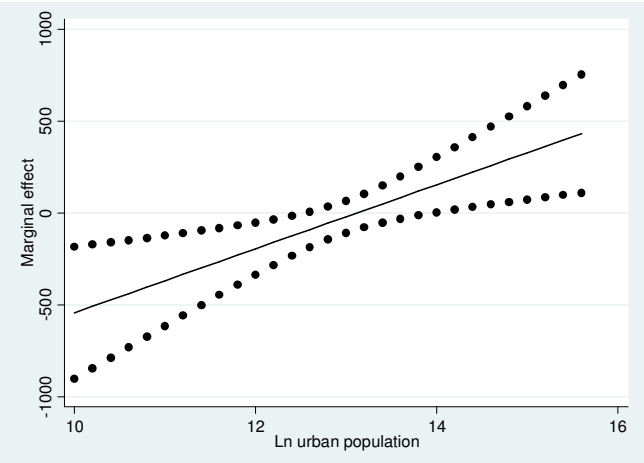
Local origin = 4

Note: 90% confidence intervals are used

Figure F8: Marginal effect of local origin on monitoring effectiveness conditional on the size of urban population for different levels of federal connections, triple interaction term, controlling for dummy education in a different region from birth



Federal connections = 0



Federal connections = 1

Note: 90% confidence intervals are used

Appendix G: Impact of mobility of governors on their performance

Table G1: Federal connection and forest monitoring, difference of means in the level of mobility between governors with and without federal connections

Variable	No federal connections	Federal connections	Difference
Mobility (including Moscow and St. Petersburg in the sample)	2.095 No.obs.: 16	2.750 No.obs.: 63	-0.655 t-stat: -2.4115 p-val: 0.0183
Mobility (excluding Moscow and St. Petersburg in the sample)	2.113 No.obs.: 15	2.666 No.obs.: 62	-0.554 t-stat: -1.999 p-val: 0.0493

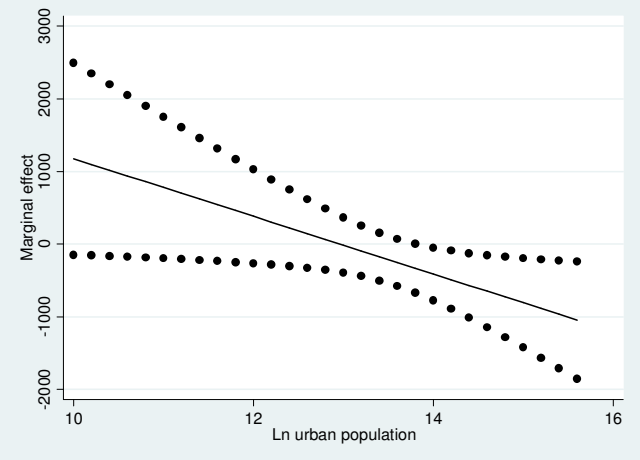
Notes: All regions, excluding autonomous okrugs are used

Table G2: Impact of local origin and federal connections on forest fire monitoring effectiveness in 2010; dep. var.: forest area covered by fire divided by the number of reported fires, controlling for mobility of governors

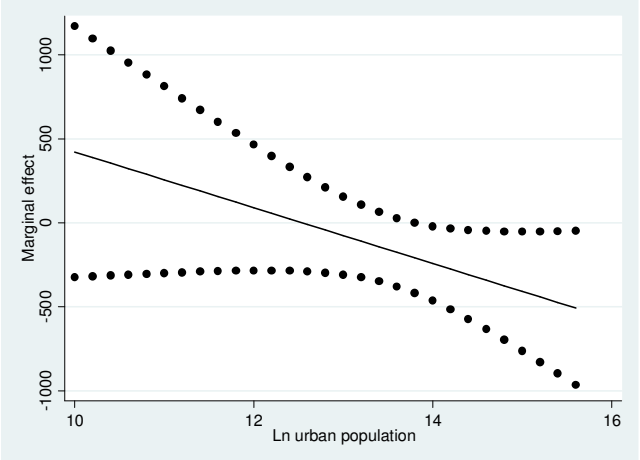
	OLS (G1)	**OLS (G2)**
Log area	**100.760****	**93.217*****
	(39.71)	**(34.18)**
Share of forest	**-6.254*****	**-5.696*****
	(2.22)	**(2.01)**
Temperature	**-62.097****	**-59.280****
	(28.01)	**(25.67)**
Rain	-1.312	-1.629
	(2.51)	(2.45)
Forestry expenditure	-2.021	-0.995
	(1.29)	(1.27)
Log urban population	-128.537	-155.427
	(155.72)	(172.52)
Local origin	151.732	109.866
	(663.28)	(709.76)
Log urban population*local origin	-10.973	-5.711
	(46.89)	(50.62)
Federal connections	**-2,535.280***	**-2,502.221***
	(1,290.07)	**(1,285.19)**
Log urban population* federal connections	**180.312***	**176.421***
	(92.49)	**(91.74)**
Mobility		64.899
		(55.72)
Constant	2,920.77	3,030.70
	(2,378.71)	(2,534.12)
Observations	71	71
R^2	0.451	0.463

Note: see Table 1. Regression (G1) is identical to the baseline regression (6) to demonstrate the robustness of effects in terms of sign *and* magnitude

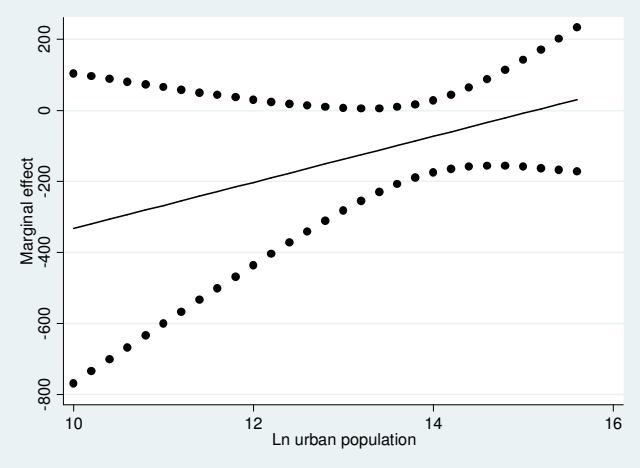
Figure G1: Marginal effect of federal connections on monitoring effectiveness conditional on the size of urban population for different levels of local origin, triple interaction term, controlling for mobility of governors



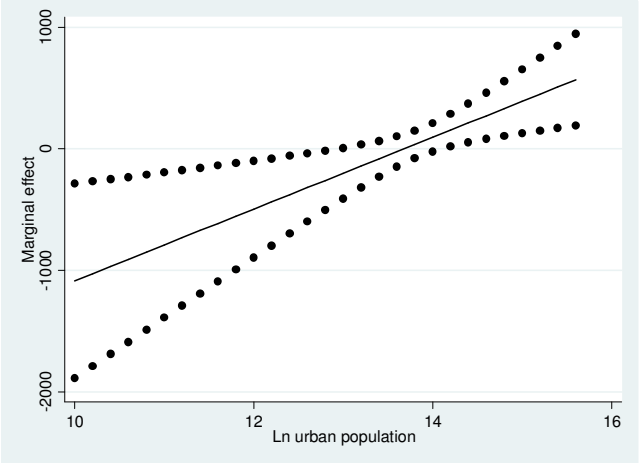
Local origin = 1



Local origin = 2



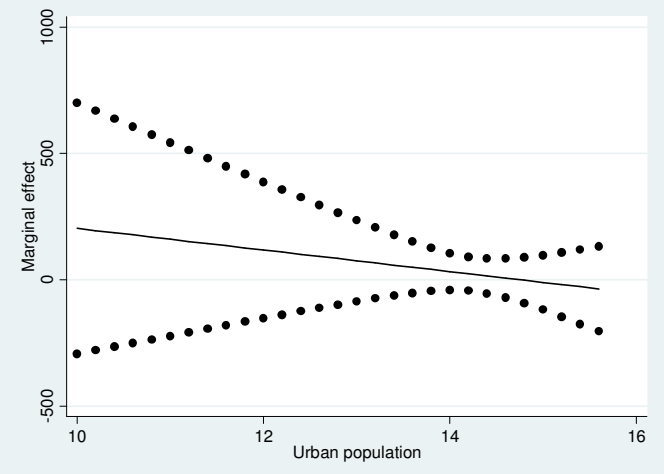
Local origin = 3



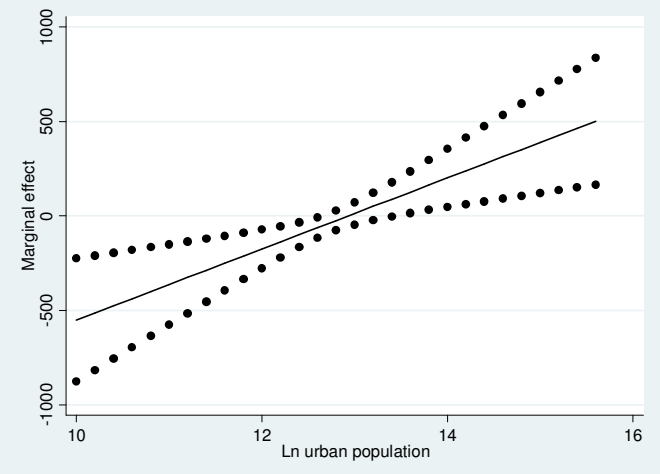
Local origin = 4

Note: 90% confidence intervals are used

Figure G2: Marginal effect of local origin on monitoring effectiveness conditional on the size of urban population for different levels of federal connections, triple interaction term, controlling for mobility of governors



Federal connections = 0



Federal connections = 1

Note: 90% confidence intervals are used