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Deregulation
of Business

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Abstract

What determines the enforcement of deregulation reform of business activities? What are the outcomes of deregulation? We address these questions using an episode of a drastic reform in Russia between 2001 and 2004 which liberalized registration, licensing, and inspections. Based on the analysis of micro-level panel data on regulatory burden, we find that: 1) On average, the reform reduced the administrative costs of firms; but, the progress of reform had a substantial geographical variation. 2) The enforcement of deregulation reform was better in regions with a transparent government, low corruption, better access of the public to independent media sources, a powerful industrial lobby, and stronger fiscal autonomy. 3) Using the exogenous variation in regulation generated by the interaction of reform and its institutional determinants, we find a substantial positive effect of deregulation on net entry and small business employment and no effect on pollution and public health. The results support public choice theory of the nature of regulation and are inconsistent with the predictions of public interest theory.

What is the nature of regulation? What are the consequences of deregulation of business activity? Theoretical debate around these questions has been active for almost a century (Pigou, 1938; Buchanan and Tullock, 1962; Coase, 1960; Stigler, 1971; de Soto, 1990). Recently, the debate has come to the attention of empirical development literature, motivated by new data sources and different experiences throughout the world.[1] Deregulation has also become popular among policymakers: in 2005 and 2006, fifty five countries undertook reforms that lowered administrative costs of starting a business and obtaining a license (World Bank, 2006). Little, however, is known about how deregulation reforms are enforced. What are the obstacles and driving forces behind the implementation of deregulation reforms? Which conditions are necessary for a deregulation reform, started by the central government, to yield desired results at the local level, where much of the regulation takes place? Despite the relevance of these questions both for policy and for the theory of regulation, so far there has been a dearth of empirical research on them. In this paper we address these questions using a unique combination of a deregulation policy experiment undertaken in Russia in the early 2000s and a detailed panel data on the actual regulatory burden on firms that spans a selection of 20 regions. This allows us to study the institutional determinants of regional reform progress controlling for all time-invariant characteristics of firms (and regions) as well as for the changes in macro-economic environment.

Between 2001 and 2004, Russia passed a series of federal laws that drastically simplified procedures and reduced the red tape associated with the entry regulation (registration and licensing) and with the regulation of existing business (inspections). The laws introduced clear measurable limits to the regulatory burden in several specific regulatory areas. In particular, the new laws require that registering a business involves a visit to just one government agency ("one-stop shop") and takes no more than a week; each inspecting agency (e.g., fire, sanitary, labor, or certification inspection) comes to inspect a business no more

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[1]See, for instance, Djankov et al. (2002); Bertrand and Kramarz (2002); Djankov, Glaeser, La Porta, Lopez-de Silanes and Shleifer (2003); Djankov, La Porta, Lopez-de Silanes and Shleifer (2003); Botero et al. (2004); Klapper, Laeven and Rajan (2004); Shleifer (2005); Mulligan and Shleifer (2004, 2005); Djankov, McLiesh and Ramalho (2006); Aghion et al. (2005, 2006); Bruhn (2007); Kaplan, Piedra and Seira (2007).

than once in two years; licenses are valid for five years. In addition, a substantial delicensing took place, i.e., a number of business activities which previously had required licenses were exempt from it.

Prior to the reform, many scholars pointed to the excessive regulatory burden on Russian firms and argued that over-regulation was among the most important reasons for Russia's poor economic performance during the first eight years of transition.[2] The proclaimed goal of the reform was to increase entry and growth of small business.

This paper addresses three distinct questions about this reform: First, we examine whether the reform succeeded in bringing down administrative costs of firms. Second, we study which institutional factors affected the level of enforcement of deregulation laws in different regions. Finally, we estimate a causal effect of deregulation on outcomes, i.e., entry, SME employment, public health, and pollution using the exogenous variation in regulation generated by the interaction between the timing of the reform and its cross-sectional institutional determinants.

We use a unique data set entitled "Monitoring of Administrative Barriers on Small Business" (MABS). The data come from regularly-repeated surveys of 2,000 firms in 20 Russian regions with questions about firms' actual levels of regulatory burden in each area of regulation affected by the reform. Firm-level panel data are collected to measure the dynamics of regulatory burden on existing firms; a repeated cross-section of newly-registered firms is collected to measure changes in the regulation of entry. The data allow observing directly the level of enforcement of each measurable target in the deregulation laws.

First, we investigate whether the *de jure* reform had an effect on *de facto* regulations using the difference in timing of enactment of laws on registration, licensing, and inspections. We estimate the average impact of the enactment of a deregulation law on the regulatory burden in the specific area of regulation affected by this law with difference-in-differences methodology. The assumption underlying this empirical methodology is that in the absence

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[2]See, for instance, Frye and Shleifer (1997); Shleifer (1997); Johnson, Kaufmann and Shleifer (1998); Shleifer and Vishny (1998); Frye and Zhuravskaya (2000).

of reform, trends in regulatory burden in different areas of regulations would have been the same. We control for all time-invariant regional characteristics and macro-economic shocks. We find that, on average, the enactment of a deregulation law leads to a significant reduction in regulatory burden. Figure 1 illustrates the level of regulatory burden and the compliance with the targets set by the deregulation laws before and after the reform.[3]

Next, we study determinants of the implementation of the reform. We explore the fact that the dynamics of regulatory burden in each area of regulation exhibits a vast geographical variation, as shown in Figure 2. The Figure presents regional dynamics of the regulatory burden in five specific regulatory areas covered by the reform. We link the variation in reform progress with the variation in regional political accountability, the strength of local industrial lobbies, and local fiscal incentives. Our choice of potential determinants of deregulation progress was motivated by predictions of the alternative theories of the nature of regulation: the public interest theory (Pigou, 1938) and the public choice theory (Tullock, 1967; Stigler, 1971; Peltzman, 1976). We estimate the differential impact of the federal deregulation laws on regulatory burden depending on the pre-reform regional institutional environment using difference-in-differences methodology. This identification strategy is valid under the assumption that, in the absence of institutional variation, the average change in regulatory burden induced by a specific deregulation law would have been the same across regions. The following measures of regional institutional environment are associated with significantly better enforcement of deregulation laws (holding everything else constant): 1) government transparency; 2) control over corruption; 3) internet penetration and other measures of the access of the public to independent media sources; 4) industrial concentration; and 5) the share of own revenues in the regional budget. We find that these institutional characteristics affect the liberalization of entry and the liberalization of regulations of established (incumbent) firms in the same way.

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[3]The DD estimator of the reform impact (if considered without any additional controls), essentially, compares the change in regulatory burden—difference in the height of bars in the figure—for the types of regulations that had been and had not been affected by the reform at each particular point in time.

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Finally, we use the interaction of reform timing with the institutional determinants of reform enforcement as an exogenous source of variation in the level of regulation to test for a causal link from deregulation to such outcomes as entry, SME employment, pollution, and public health. Instrumenting regulation is important because of reverse causality going from outcomes to regulation. Using 2SLS, we find a significant negative effect of licensing and inspections on the number of small businesses (a proxy for net entry) and of the number of registration agencies and inspections on employment in small businesses. In contrast, there is no robust effect of regulation on either pollution (measured by contaminants' emission from stationary sources into the atmosphere) or public health (measured by morbidity from injuries and poisoning per 1,000 people).

We use this evidence to evaluate the two competing theories of the nature of regulation: public interest and public choice. Our results are inconsistent with the public interest theory and fully consistent with the public choice theory as regions with transparent and accountable authorities and with the independent sources of information for the public, such as internet and independent newspapers, achieve better progress in deregulation. Furthermore, deregulation does not have an adverse effect on pollution or public health despite the increase in the number of SMEs and their employment.

Our results also shed light on the theory of institutional change in transition economies. Consistent with the "demand for reform" theory of the determinants of reform progress (Boycko, Shleifer and Vishny, 1995) which implies that privatization creates a political force in favor of continuation of structural reforms, we find that strong industrial lobbies in the Russian regions facilitated progress in deregulation reform. Using the logic of Grossman and Helpman (1994) we use the variation in regional industrial concentration as a proxy for the variation in the strength of regional industrial lobbies.

Our analysis is most closely related to Djankov et al. (2002) both in the theoretical approach and empirical findings. The contribution of our paper goes beyond the analysis in Djankov et al. (2002) in several important ways. First, we consider the actual regulatory

burden and compare it to the official level, established by the legislation, we show that official regulations are poorly enforced and grossly understate the actual regulatory burden. Second, we show that there is a vast variation in regulatory burden within a country and looking only at the largest city may give a misleading picture about the state of regulation in the country as a whole.[4] Third, panel data allow us to control for unobserved regional and firm-level variation as well as time trends and, therefore, substantially improve on the cross-sectional analysis of many previous studies (e.g., Djankov et al., 2002; Klapper, Laeven and Rajan, 2004; Djankov, McLiesh and Ramalho, 2006). Fourth, we extend the analysis beyond regulation of entry and compare the regulation of established business to entry regulation.

Our paper is also closely related to Aghion et al. (2006); the two papers study complementary channels through which local institutions affect the outcomes of a nationwide deregulation reform.

The paper is organized as follows. In Section 1, we describe the reform and the regulations data. In Section 2, we present hypotheses about the institutional determinants of deregulation progress and describe institutional measures. Section 3 focuses on the estimation of the effect of reform on the actual regulatory burden and the institutional determinants of reform progress. Section 4 reports the estimates of the effect of regulations on outcomes. Section 5 discusses robustness. Section 6 concludes.

1 Background and the measures of regulation

1.1 The reform

The level of regulatory burden prior to the Russia's deregulation reform was extremely high. The goal of the reform was to speed up and simplify administrative procedures, reduce red tape, and, ultimately, to cut costs of firms associated with inspections, licensing, registration, and certification. The reform consisted of a package of laws passed during 2001-2004. Five

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[4]Bertrand and Kramarz (2002); Aghion et al. (2005, 2006); Bruhn (2007); Kaplan, Piedra and Seira (2007) also focus on within-country variation.

different laws have come into force at different points in time: the law on inspections – on August 8, 2001; the law on licensing – on February 11, 2002; the first version of the law on registration – on July 1, 2002; the law on certification ("technical regulation") – on July 1, 2003; and the second version of the law on registration – on January 1, 2004.

These laws (with the exception of the law on certification) introduced clear measurable targets for the maximum level of regulatory burden associated with these areas of regulation (e.g., Buev, Makarova and Shehovtzov, 2005; Shehovtzov et al., 2005). The law on inspections postulated that each inspecting agency is allowed to conduct a maximum of one inspection in each particular firm in two years. The previous legislation did not put a limit to the number of visits by inspectors. The law on licensing reduced the list of business activities which require licenses from 250 to 103 activities. For example, the following business activities were exempt from licensing in 2002: realters, pawn shops, publishing houses, audio studios, private certification firms, antique shops, construction firms, bread making, wholesale and retail of bread, drilling and drill manufacturing, service work in sea ports. In addition, the law on licenses increased the minimum length of license validity from three to five years. The first version of the law on registration introduced the maximum of five working days during which any firm with all necessary documents should receive registration from the authorities (previously, the length of registration procedure was not restricted by law). The second version of the law introduced a "one-stop shop" rule for registration and formalized the list of required documents for registration. Previously, any start-up had to register with several different agencies, e.g., the tax ministry, the pension fund, the social security, the statistical and fire department, local administration, and the rules for registration differed across localities. According to the new (2004) version of the law, all of the registration is done at a local branch of tax ministry.[5] In addition, licensing reform reduced the official monetary fee for obtaining licenses, but not substantially. We focus on these measurable

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[5]In addition, the first version of the law on registration enacted in 2002 decreased the number of agencies needed for registration by one by disbanding the registration chamber and moving all of its operations into the tax ministry.

targets of deregulation reform in registration, licensing, and inspections.[6]

1.2   MABS survey

Jointly with a team of experts from an independent Moscow think tank – the Center for Economic and Financial Research (CEFIR, www.cefir.org) – we conducted a long-term project of the Monitoring of Administrative Barriers to Small business (MABS). The project collected data on regulatory burden on Russian firms allowing evaluation of the progress of deregulation reforms in a selection of Russia's regions. The MABS is based on regularly repeated surveys of top managers in 2,000 small firms in 20 regions of Russia. During face-to-face interviews, top managers of firms are asked questions about firms' actual quantifiable costs, associated with inspections, licensing, registration, certification, and tax administration, as well as their subjective perceptions of the business climate.[7] Two primary survey instruments are used: one inquires about the regulatory burden on firms established more than a year ago and the other is designed for the newly registered start-ups in order to monitor the administrative costs of entry. Panel data are collected to monitor administrative burden on existing firms which comes from inspections and continuation licenses and a repeated cross-section is collected to monitor costs of registration and start-up licenses. New start-ups constitute about 20% of the total sample in each MABS round. In each region, the sample of established firms is representative of small and medium-size enterprizes, the sample of startups is representative of newly registered firms.

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[6]In addition to the laws described above, the law on simplified tax system for small businesses was passed on January 1, 2003. This law introduced two changes into Russian taxation system: 1) it significantly increased the scope of application of the existing system of simplified tax administration which allows small firms to pay a single "unified" tax with a flat rate on either profit or revenue instead of many taxes, i.e., VAT, profit, sales, and property taxes; and 2) the new law reduced the tax rate for the "unified" tax. For the vast majority of small firms—and, thus, for firms in our data set—the law on simplified tax system changed the tax rate but did not affect tax administration because they already were eligible to use the "unified" tax. We abstract from laws on certification and on simplified tax system because (1) the law on certification did not introduce clear measurable benchmarks, and therefore, one cannot directly observe whether it is enforced; and (2) the law on simplified tax system did not affect tax administration for the vast majority of firms in our sample.

[7]In this paper, we focus exclusively on the *objective* data on the regulatory burden because, apart from being affected by reform, the subjective perceptions are influenced by many unobserved factors.

The data set includes the results of all six rounds of the MABS survey conducted in the spring and the fall of 2002, the spring of 2003, 2004 and 2005, and the fall of 2006.[8] Each round collected information about all aspects of the regulatory burden on firms for the immediately preceding six months and, in addition, about the inspections for the six-month period before that (e.g., the fifth round took place in the spring of 2005 and collected all variables for the second half of 2004 and a few variables on inspections for the first half of 2004).

Figure 3 presents the timing of different stages of deregulation reform and the periods covered by the MABS data. The first round of the MABS survey collected the baseline information from the time before any of the deregulation laws came into force. The data from the second round onwards allow evaluation of the reform progress after the enactment of the law on inspections; the data from the third round onwards enable an assessment of the effect of the licensing law and the first version of the law on registration. The last two rounds allow evaluation of the impact of the second version of the registration law.[9]

1.2.1 The measures of regulation

Table 1 lists all the regulatory measures used in this paper. For every firm in the sample at each point in time, we measure the level of regulatory burden in each specific regulatory area affected by the deregulation reform and record whether it meets the target set by the

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[8]See CEFIR reports on MABS results at www.cefir.org/index.php?l=eng&id=25.

[9]All of the MABS data are in half-year increments. The enactment of the two laws on registration fell exactly between the MABS rounds: the first version of the registration law was enacted between rounds 2 and 3; and the second version – between rounds 4 and 5. This is not the case for the laws on licensing and inspections. In the empirical analysis, we assume that the law on inspections took force after the round 1 and before round 2, even though in reality the law took force in the *middle* of round 1. Similarly, we assume that the law on licenses took force between rounds 2 and 3 (rather than in the middle of round 2). This is done for two reasons: first, one should expect at least a few months lag between the enactment of the law and its implementation; and second, during the half a year period when each of these laws were enacted, inspectors and license authorities may have deliberately shifted their activities earlier in the respective half-year periods in order to avoid the need to comply with the new laws. (In the Section 5, we discuss that the results are robust to making an alternative assumption.) In addition, it is important to note that the timing of the laws on certification and on simplified tax system is such that they are not a confounding factor to the deregulation laws that we consider. Both of them were enacted between rounds 3 and 4 of the MABS survey.

reform.

In particular, for registration, we look at the log number of agencies a startup firm visited in order to register, the log number of days the registration took, a dummy for more than one "window" for registration (i.e., visits to several agencies as opposed to a one-stop-shop registration), and a dummy for more than a week for registration. The two dummies measure the failure to meet the respective deregulation targets.

For inspections, we look at the log number of sanitary inspections over six months and the respective violation of the deregulation target: a dummy indicating whether there was more than one sanitary inspection in six-month period.[10] We focus on sanitary inspection because it is one of the most frequent inspectors of firms in our sample.

To describe the measures of regulatory burden in the area of licensing, let us first define the terms. We call a license *"legitimate"* if it is issued for a business activity that is supposed to be licensed according to the 2002 deregulation law on licenses. In turn, we call a license *"illegitimate"* if it is granted for an activity that is not supposed to be licensed according to this law.[11] We consider the following measures of licensing regulations for each firm: the log number of illegitimate licenses; minus log term of validity of legitimate licenses; a dummy for the presence of an illegitimate license; and a dummy for less than 5-year-term of license validity. Again, the dummies indicate the failure to meet deregulation targets.

Summary statistics for the measures of regulation are reported in the Panel A of Table A.1 in the appendix. The means of variables measuring regulation level (without taking

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[10]The dummy picks out only the extreme violations of the deregulation target, because the law limits the number of inspections to one in *two years*, whereas we look at the situations with two or more inspections in a firm during *six months* in order to avoid residual autocorrelation. These extreme violations are not rare: in 2001, 12% of all firms had more than one sanitary inspection in six months; the situation improved by 2006 (five years after the law took force), but the rate of violations of this deregulation target remained non-trivial: 6.4% of firms.

[11]For example, if a realter firm applied for and was granted a licence to operate after 2002, we record a violation of the law and call this licence illegitimate. The data show that many firms applied for and were granted licenses for the activities that do not require licenses according to the new licensing law after it took force. In focus group interviews, firm managers said that it is cheaper for them to pay for the illegitimate licenses than go to defend their right to operate without a license in court. Most illegitimate licenses have been granted by regional authorities.

logarithms) are presented in Figure 2 for each region.[12]

2 Hypotheses about the enforcement of deregulation

In this section, we formulate hypotheses of the two alternative theories of the nature of regulations, the public choice and public interest, about the institutional determinants of progress in deregulation.

We consider three institutional factors: accountability of local governments to the public (measured by government transparency, control over corruption, and access to independent media sources), the strength of local industrial lobby (measured by industrial concentration and state capture indices), and the strength of fiscal incentives of regional governments (measured by the share of own tax revenue in the regional budget). All institutional measures are described in the Data Appendix and are summarized in the Panel B of Table A.1. The next two subsections focus on the predictions of the two theories about the effects of political accountability and the strength of industrial lobbies on the progress in deregulation; the predictions of the two theories about the effect of these institutions differ. In Section 2.3, we discuss the predictions of both theories about the effect of fiscal incentives which go in the same direction.

2.1 Predictions of the public choice theory

The public choice theory states that opportunistic bureaucrats create welfare-reducing regulations (e.g., Tullock, 1967). The bureaucrats' motivation for excessive regulation comes from two sources. First, the "tollbooth" view of regulations implies that excessive regulations allow bureaucrats to collect rents for themselves by collecting bribes in exchange for avoiding regulations (McChesney, 1987; de Soto, 1990; Shleifer and Vishny, 1993). Second,

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[12]Not all the data points are available for all regions and rounds. In particular, there are no data on newly-registered firms in the round 4 for 11 out of 20 regions. The reason was the resignation of the Russia's cabinet of ministers leading to the situation in which nobody in the government knew where the data on the registration of firms were located; these data were needed for sampling of new firms in the round 4 of MABS. In addition, there are no data for Altaisky Krai in the 3rd round due to a reorganization of the regional survey agency, which was supposed to conduct the survey.

the regulatory capture view of regulations implies that bureaucrats act as agents of industry incumbents who use regulation as protection from competition of potential entrants (Stigler, 1971; Posner, 1974; Peltzman, 1976).

The public choice theory of regulation unambiguously predicts that more accountable governments impose lower regulations. Thus, we expect more transparent, less corrupt, and better monitored by independent media regional governments to exhibit better progress in deregulation.

The public choice theory, however, has different predictions for the effect of the strength of industrial lobbies on the progress of deregulation depending on whether bureaucrats collect rents for themselves or are captured by industry incumbents; and in the latter case, the prediction depends on the nature of competition and considered regulations (i.e., entry regulations and regulations of existing firms). Under the "tollbooth" view of regulations, all businesses including the politically powerful and organized suffer from regulations. Since the politicly-powerful and better organized businesses are better positioned to lobby for deregulation, one would expect better progress in deregulation in regions with strong industrial lobby.

Under the regulatory capture view, the prediction is less straightforward. It depends on whether large firms which usually form strong lobbies compete with small business startups or not. This is because the Russian deregulation reform affected the regulations of entry which can plausibly deter entry only of small firms, such as excessive red tape in registration and licensing. If small entrants are in competition with politically powerful firms in product or labor markets, one would expect the presence of strong lobbies to have an adverse effect on the implementation of deregulation of entry, i.e., registration and startup licensing. At the same time, strong lobbies are expected to have a beneficial effect on the deregulation of existing businesses, such as inspections or continuation licenses, because these regulations affect incumbents themselves. It is more plausible, however, that in Russia small potential entrants and members of powerful industrial lobbies are not in direct competition. First,

they produce different goods and services; second, large firms in Russia as in many other transition countries are often interested in shedding excess labor which is less politically costly with growing small enterprize sector. In the latter case, the prediction is that strong industrial lobbies would facilitate deregulation in all areas including the deregulation of entry.

2.2 Predictions of the public interest theory

The public interest theory's basic premise is benevolent government which sets regulation to correct market failures (Pigou, 1938). The mere presence of deregulation reform is hard to reconcile with the public interest theory. The reason is that the deregulation reform puts constraints on bureaucrats so that they cannot increase regulatory burden (e.g., to inspect a firm more than twice in two years). If bureaucrats are publicly-motivated, there is no need to place constraints on them. If market failures go down, benevolent local bureaucrats lower the level of regulation accordingly without a need for a federal law. Thus, the federal deregulation reform may arise in two cases. It can happen when local governments are benevolent while the federal government serves some special interest. Or, alternatively, it could happen when the changes in the federal legislation are only a reflection of the reduction in market failure that would have lead to a reduction in local regulatory burden irrespective of the legal change. In either case, the public interest theory predicts that the progress of reform should not depend on government transparency or the access of the public to independent sources of information. Since publicly-motivated bureaucrats do not care for special interests, the presence of strong industrial lobby also should not have an effect on deregulation as long as it is not correlated with market failure. One could argue, however, that concentrated industries with strong lobbies may be subject to market failures (e.g., monopolization); then, one would expect higher regulation levels for existing firms to cure market failures in regions with higher industrial concentration.

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2.3 Prediction of both theories about fiscal incentives

Both theories of the nature of regulation predict that bureaucrats respond to fiscal incentives. In particular, if budgets of local politicians primarily rely on own revenues (i.e., local taxes) rather than on discretionary transfers from the federal budget, politicians have stronger incentives to enforce deregulation laws in order to maximize tax base by fostering business growth irrespective of whether they want to divert revenue or use it according to public interests (Zhuravskaya, 2000; Jin, Qian and Weingast, 2005).

3 The enforcement of reform and its determinants

The Russian deregulation reform gives us a good opportunity to test hypotheses outlined in the previous section because it allows observing the effect of the pre-determined (i.e., pre-reform) institutional characteristics on the local enforcement of exogenously-given from the point of view of the regions change in federal regulation laws.

First, we focus on the average reform progress across all areas of regulation and estimate how it is affected by the institutional characteristics (Section 3.1). Second, as institutions may differently affect the enforcement of reforms in different regulatory areas, we study the effect of institutional measures on deregulation progress separately in each specific area of regulation (Section 3.2).

3.1 The implementation of deregulation on average

3.1.1 Methodology, the effect of the reform on average

We estimate the average impact of adoption of a law from deregulation package on the actual level of regulatory burden using the difference-in-differences (DD) estimators by relying on the variation in the timing of enactment of different deregulation laws. Our main focus is on analyzing the institutional determinants of reform progress: We explore the differential impact of an average deregulation law on regional regulatory burden depending on the regional institutional environment using the difference-in-differences-in-differences (DDD) estimators.

We construct two alternative measures of regulatory burden comparable across types of regulations, firms and over time: (1) a proxy for the overall level of regulation and (2) a proxy for the overall level of violation of targets set in the deregulation laws. First, we select variables from the MABS survey that measure the regulatory burden along the five dimensions targeted by the deregulation laws. The measures of the level of regulatory burden on firms at each point in time are: 1) the number of illegitimate licenses; 2) minus the term of license validity; 3) the number of sanitary inspections; 4) the number of days needed for registration, and 5) the number of agencies needed for registration. For comparability across these series, for each of these five variables we construct Z-scores by subtracting the sample mean and dividing by standard deviation. To measure the extent of violations of the deregulation targets along the five dimensions of reform, we take dummies indicating whether firm had 1) an illegitimate license; 2) a legitimate license with too short term of validity; 3) more than one sanitary inspection in half a year; 4) more than one week for registration; and 5) more than one window for registration. Then, we pool the five series within the two groups together. This yields two variables which vary across firms, five dimensions of regulations, and six points in time: 1) z-scores measuring the level of regulation in a particular firm for different types of regulations at different points in time and 2) dummies measuring the violations of targets set by the deregulation laws in a particular firm at a particular point in time.[13]

We denote these measures by V_{ift}, where i indexes the five dimensions of regulatory reform, f indexes firms, and t indexes rounds of the MABS survey (i.e., our measure of time). For each of the two measures of the overall regulatory burden, we run OLS regressions with fixed effects for each dimension of regulation in each region:

$$V_{ift} = \alpha(I_r - \bar{I}) * AFTER_{it} + \beta(V_{ift_0} - \overline{V_{t_0}}) * AFTER_{it} + \gamma AFTER_{it} + \delta' \mathbf{X}_{ft} + \mu' \mathbf{Z}_{rt} + \phi_{ir} + \rho_t + \varepsilon_{ift}.$$

$$(1)$$

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[13]The two measures are theoretically distinct because the level of regulation can differ even in situations when all targets of deregulation laws are met or when all of them are violated. In the latter case, the level of regulation would measure the distance to targets set in the deregulation laws.

Here, r refers to the region where firm f is located. The variable $AFTER_{it}$ denotes a dummy indicating whether the respective deregulation law responsible for the regulatory measure i is in force at time t or not. As different deregulation laws took force at different points in time, "after reform" dummy ($AFTER_{it}$) varies both over time and across regulations i. The coefficient γ on the "after reform" dummy is a DD estimate of the average effect of adoption of a deregulation law on the overall regulatory burden. I_r denotes a particular institutional characteristic of a region r which can potentially affect the deregulation progress (i.e., measures of government transparency, control over corruption, availability of independent media sources, the strength of local industrial lobbies, and the share of own revenue in local budget).[14] It is important to note that our institutional determinants do not vary over time and were measured in 2000, i.e., before the reform had started.[15] Our main coefficient of interest, α, is a DDD estimate of the impact of institutional characteristics (I_r) on the progress of the deregulation reform. To be precise, it estimates the differential effect of the deregulation reform (i.e., the enactment of the deregulation laws) on the level of actual regional regulatory burden in an average region depending on the level of regional institutional characteristic (I_r).

We include the following covariates into the regression equation. τ_t are the fixed effects for time and ϕ_{ir} are fixed effects for each regulation i in each region r. Regulation*region fixed effects control for all time invariant characteristics of regions and of types of regulations in each region, including the initial level of regulatory burden. Time fixed effects control for all global trends and macro-economic events that uniformly affect regulations during the sample period. An important control variable is the interaction of the initial level of regulatory burden (V_{ift_0}) and the "after reform" dummy ($AFTER_{it}$). The coefficient on this interaction measures the extent to which the progress in deregulation reform depends on the initial level of regulation. Since the institutional environment is often correlated with

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[14]See Data Appendix for details on these measures.

[15]In order to interpret the coefficient γ as the full effect of reform at the mean level of institutional environment, we subtract the sample means ($\bar{I}$ and $\overline{V_{t_0}}$) from I_r and V_{ift_0} before taking their cross-terms with $AFTER_{it}$.

the initial level of regulation, without this covariate one could have found spurious correlation between the progress of reforms and institutions.[16] The initial time period (t_0) refers to the first round of the MABS survey that measures the benchmark level of regulatory burden before any of the deregulation laws took effect, i.e., the second half of 2001.

$\mathbf{X}_{ft}$ is a vector of controls for basic firm characteristics, i.e., age, size allowing for a quadratic term, legal firm, state vs. private ownership, and industry.[17] $\mathbf{Z}_{rt}$ is a vector of additional regional covariates; it includes the logarithm of regional population to control for the regional size and the mean individual income to control for prosperity of the region. It is important to note that we correct standard errors to allow for clustering of error terms (ε_{ift}) for all observations within each region that are related to registration, licensing, and inspections, yielding $3 * 20 = 60$ clusters. Clusters take care of two potential concerns: autocorrelation in residuals and cross-sectional correlation among the observations within areas of regulations in each region (Bertrand, Duflo and Mullainathan, 2004).

As with any DD estimation, our empirical strategy is valid only if the following two assumptions hold (subject to holding all covariates constant): 1) in the absence of the deregulation reform, different regulatory measures would have had the same overtime trend; and 2) in the absence of the institutional variation among regions, reform impact on each of the regulatory measures would have been uniform across regions.

3.1.2 Results: the average effect on the overall level of regulation

Table 2 presents the results. The first row of the table shows that the reform caused a substantial statistically significant improvement in the regulatory burden. The coefficients on $AFTER$ are negative and statistically significant. On average, the enactment of a new deregulation law leads to a decrease in the rate of violation of a specific deregulation target

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[16]The strength of local industrial lobbies (industrial concentration and the state capture index) are positively and significantly correlated with the initial level of regulation, whereas government transparency has a negative and significant correlation with the initial regulation level.

[17]Previous literature documented a large variation in regulatory environment faced by firms within localities and showed that variables in $\mathbf{X}_{ft}$ explain much of this variation. See, for instance, Carlin, Schaffer and Seabright (2001, 2006); Frye and Zhuravskaya (2000).

set by this law of about 24 percentage points (0.56 of the SD); and it leads to a decrease in the level of regulatory burden in an average firm in the specific regulatory area covered by this law of 0.2 of its standard deviation (SD).

What determines the differences in reform progress among regions? The Table 2 reports results for the five institutional variables – transparency of authorities, internet penetration, control over corruption, industrial concentration of employment, and fiscal incentives (i.e., the share of own revenues).[18] Each of these institutional measures facilitated enforcement of deregulation reform. The coefficients α—the estimates of the effect of institutions on the reform progress—in all of these regressions are negative and, with two exceptions, statistically significant. Thus, government transparency, the presence of independent sources of news, i.e., internet and independent radio and newspapers (the latter are not reported for conciseness but discussed in the robustness section), control over corruption, the presence of strong industrial lobby, and strong fiscal incentives have a significant effect on the overall progress in implementation of deregulation reform. These results are fully consistent with the predictions of the public choice theory of the nature of regulations discussed in Section 2. In contrast, the results about the effect of independent media, government transparency, and industrial concentration are inconsistent with the predictions of public interest theory.

To analyze the magnitude of the effect of institutional characteristics on the progress of reform, we compare the changes in regulatory burden induced by the reform for regions, where these institutional characteristics differ by one standard deviation holding everything else constant. We start with describing the magnitude of the effects of local accountability. Suppose, in region A the level of government transparency is one half of its SD above the sample mean and in region B it is one half of the SD below the mean; then, the adoption of a deregulation law would lead to a 2.4 percentage point larger compliance with deregulation targets and 6% of the SD lower level of regulation in the region A compared to region B as a result of reform. Consider now two regions that differ only in the level of control over

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[18]Robustness of the results to using alternative measures of institutions is discussed in the robustness Section 5.

corruption; in the region with higher corruption, the rate of violation of deregulation targets would decrease by 2 percentage points lower than in region with low corruption. Internet penetration also significantly improves the implementation of reforms: there is a 4% of the SD difference in the magnitude of a decrease in the level of regulation as a result of the deregulation reform.

The magnitude of the effects of the strength of local industrial lobbies and fiscal incentives is as follows. If one compares two regions in which industrial concentration of employment differs by one SD, in a region with higher industrial concentration, the reform leads to a 5% of the SD larger decrease in the overall level of regulation and a 2 percentage point larger decrease in the level of violation of deregulation targets as a result of reform. If one compares two regions in which the share of own revenues in local budget differs by one SD, in a region with higher fiscal incentives, the reform leads to a 6% of the SD larger decrease in the overall level of regulation and 2 percentage point larger decrease in the level of violation of deregulation targets as a result of reform.

The effect of institutional characteristics is estimated holding all other variables including the initial level of regulation constant. It is worth noting that the initial severely of regulatory burden itself is a very important determinant of the magnitude of the change following the reforms. The coefficients on the interaction of the initial level of regulatory burden and "after reform" dummy are statistically significant and large in magnitude. Thus, the reform partially equalized the level of regulatory burden across firms: a one SD higher initial level of regulation and a 10 percentage point higher rate of violation of a particular deregulation target leads on average to a 0.8 SD higher decrease in the level of regulation and an 9 percentage point higher decrease in the rate of violation of deregulation laws following the reform.

3.2 Reform progress in specific regulatory areas

Section 3.1 established the average effect of institutions on reform progress across regulatory areas. A priori it is not clear, however, whether the institutions affect progress in different regulatory areas in a similar manner or, alternatively, the direction and the magnitude of the effect of a particular institution differ for different regulatory areas. Are the results from the previous section driven by the effect of institutions on reform progress in a particular regulatory area rather than all of them? Are there institutions that help reforms in one regulatory area and hamper reforms in another? We address these questions in this section.

3.2.1 Methodology, specific regulatory areas

Henceforth, we treat each measure of the actual regulatory burden and of the violation of each deregulation target as a separate dependent variable. The methodology is, again, the difference-in-differences. We regress each of these variables on the interaction between the "after reform" dummy and a potential institutional determinant of deregulation (I_r). We control for time and region- or firm-fixed effects depending on whether we look at new startups for which we have repeated cross-section or established firms for which we have panel data. Firm-level panel data on established firms contains information on licensing and inspections; repeated cross-section of new firms contains information on licensing and registration.

Thus, for licensing and inspections in established firms, we estimate equation with firm fixed effects (ϕ_f):

$$R_{ft} = \alpha I_r * AFTER_t + \beta R_{ft_0} * AFTER_t + \delta' \mathbf{X}_{ft} + \mu' \mathbf{Z}_{rt} + \phi_f + \rho_t + \varepsilon_{ft}; \qquad (2)$$

whereas for licensing and registration of new firms, the estimated equation has region fixed effects (ϕ_r):

$$R_{ft} = \alpha I_r * AFTER_t + \beta R_{rt_0} * AFTER_t + \delta' \mathbf{X}_{ft} + \mu' \mathbf{Z}_{rt} + \phi_r + \rho_t + \varepsilon_{ft}. \qquad (3)$$

R_{ft} stands for one of the specific measures of regulatory burden (listed in Panels A to C of Table 1 and summarized in Table A.1). The rest of the notation is the same as in Equation 1. As above, I_r denotes a particular institutional characteristic of a region r which can potentially affect deregulation progress; $AFTER_t$ denotes a dummy indicating whether the respective deregulation law is in force or not yet. In contrast to Equation 1, in Equations 2 and 3 "after reform" dummy varies only over time because in each regression we consider a specific regulation affected by reform only once. "After reform" dummy is, therefore, collinear with time dummies and omitted from the list of regressors. Our primary parameter of interest (α) estimates the differential effect of the enactment of a specific deregulation law on the level of actual regulatory burden in the specific regulatory area covered by this law in an average firm depending on the level of institutional characteristic I_r. Again, we control for the interaction of the "after reform" dummy with the initial (before reform) level of regulatory burden (R_{ft_0}). In Equation 2, we correct standard errors to allow for clustering of error terms (ε_{ft}) within each firm to account for residual autocorrelation. In Equation 3, we correct standard errors to allow for clustering of error terms (ε_{ft}) within each round and region to account for residual correlation among firms within region. The results are robust to making alternative assumptions about the variance-covariance structure of the error term.

The main assumption necessary for the validity of this DD methodology is that in the absence of institutional variation the average change in regulatory burden as a result of reform would have been the same across regions for a given level of **X** and **Z**.

3.2.2 Results: the determinants of reform progress in specific regulations

Results are presented in Tables 3 and 4. First, let us discuss the results for the sample of established firms where we control for firm fixed effects. Table 3 reports regressions with firm fixed effects for two selected regulatory measures: "at least one illegitimate license" and "more than one sanitary inspection." Column 1 of Table A.2 provides abbreviated results (i.e., the point estimates of α) for all other regulatory measures. All institutional measures

(with the exception of fiscal incentives), i.e., government transparency, internet penetration, control over corruption, industrial concentration, and the share of own revenues, significantly improve the local enforcement of delicensing reform; and all the institutional measures (with the exception of control over corruption) significantly improve the enforcement of reform in limiting the number of sanitary inspections.

These results are powerful because they account for all the variation across firms; they, however, are limited to established firms only. Since we are interested in comparing the effect of institutions on the reform progress for incumbent firms and for new entrants, we also report results of estimation of Equation 3. Table 4 reports full regression output for selected regulatory measures and Column 2 of Table A.2 reports abbreviated results for all regulatory measures. Panel A of Table 4 replicates the results for the established firms with regional instead of firm fixed effects: the results are qualitatively the same. Panel B of Table 4 presents results for newly-registered startups. Industrial concentration, government transparency, and internet penetration significantly reduce the probability that a startup firm has to use more than one agency for registration and apply for an illegitimate license as a result of the reform. The effect of control over corruption has the same sign but is statistically insignificant. Fiscal incentives significantly affect reform progress only in reducing the number of windows for registration.

Interestingly, there is no difference in the direction of the effect of institutional measures, and particularly, industrial concentration, for entry regulations and the regulations of existing businesses. Thus, industry incumbents do not lobby for an increase of the entry regulations. On the contrary, they lobby for lower entry regulations as well as lower regulations of their own activities. This result contrasts with the prediction of the regulatory capture theory under the assumption that large business lobbies compete with small potential entrants, which—as we discussed in Section 2—may not be a reasonable assumption. If there is no competition between small business entrants and large industrial lobbies, regulatory capture theory cannot be tested using data on Russia's deregulation reform.

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We find no effect of any of the institutional measures on reform progress in reducing the number of days for registration or lengthening the term of license validity for both old and new firms (see Table A.2).[19] Thus, the average effect of the enactment of a deregulation law, estimated in Section 3.1, averaged between the large effect of the institutional characteristics on the reform progress in delicensing, reducing the number of windows for registration, and limiting number of inspections, and no effect of these institutions on the reform progress in reducing the length of registration and increasing the length of license validity.

Overall, the results are consistent for the regressions with region and firm fixed effects and for the samples of old firms and startups.

The economic significance of these results is as follows. A one SD increase in the Herfindahl-Hirschman index of industrial employment leads to a 2.4 and 3.7 percentage point larger decreases in the probability to get an illegitimate license for an average established firm and a startup firm, respectively, a 7 percentage point larger increase in the probability of "one-stop-shop" registration of an average startup, and a 1.2 percentage point larger decrease in the probability that an average established firm is inspected more than once in half a year by the sanitary agency as a result of deregulation. A one SD increase in the transparency of authorities leads to the following improvement in the progress of deregulation reform for an average established firm: a 3 percentage point larger decrease in the probability of having an illegitimate license and a 1 percentage point larger drop in the probability to have more than one sanitary inspection in six months. For startups, a one SD increase in the government transparency leads to a 9 percentage point larger increase in probability of a "one-stop-shop" registration and a 4 percentage point larger decrease in the probability of an illegitimate license.

A one SD increase in the internet penetration leads to a 3 and 5 percentage point larger decreases in the probability of an illegitimate license in an established and a startup firm, respectively, a 1 percentage point larger decrease in the probability to be inspected by the

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[19]It is plausible, however, that the length of license validity changes only with a lag; in particular, this would be the case if the starting and ending times of licenses are correlated across firms.

sanitary agency, and a 12 percentage point larger increase in the probability of having to visit a single agency for registration.

To summarize, our main finding in this section is that industrial concentration, government transparency, and internet penetration consistently significantly and robustly affected implementation of reform in limiting the number of inspections, delicensing, and establishing one-stop-shop registration. These results are inconsistent with the public interest theory of the nature of regulations and fully consistent with the tollbooth theory.

4   The deregulation outcomes

An important question for testing the public choice and public interest theories of regulation is whether regulation is beneficial or detrimental for social welfare, growth, and development. Political and development economists have addressed this question in many different contexts (e.g., de Soto, 1990, 2000; Djankov et al., 2002; Bertrand and Kramarz, 2002; Botero et al., 2004; Djankov, La Porta, Lopez-de Silanes and Shleifer, 2003; Aghion et al., 2006). A common problem with figuring out the effect of regulation on any of the outcomes is endogeneity of regulation. On the one hand, under the public interest theory, benevolent regulators should regulate more in places where there are higher market failures. This could lead to a reverse causality from poor outcomes (e.g., poor quality of goods or pollution) to higher levels of regulation. On the other hand, under the public choice theory, predatory regulators may be disproportionately attracted to places where there is a thriving business growth because they can generate more rents by preying on successful and profitable firms. This could lead to a reverse causality from business growth to higher regulation levels. Without finding an exogenous source of variation in regulation, causal claims based on correlation between regulatory burden and economic outcomes are problematic.

Russia's deregulation reform is a policy experiment that provides instruments for solving this endogeneity problem. Our main goal in this section is to establish a causal relationship going from the level of regulation to such outcomes as net entry, small business employment,

pollution, and morbidity. We are interested in estimating the following relationship:

$$S_{rt} = \xi \bar{R}_{rt} + \zeta' \mathbf{Z}_{rt} + \phi_r + \rho_t + \varepsilon_{rt}. \tag{4}$$

The dependent variable (S_{rt}) stands for one of the following regional outcomes: the net entry (measured by the log number of small businesses), small business employment (measured by the number of employees in small business sector per capita), pollution (measured by the log emissions of contaminants into the atmosphere), and public health (measured by morbidity from injuries and poisoning per 1,000 people). The regional outcome variables are summarizes in the Panel C of Table A.1. They come from the official Russia's statistical agency *Rosstat*; and are available for all regions annually up until 2004 (inclusive), i.e., for the period from the first to the fifth round of MABS survey.

$\bar{R}_{rt}$ stands for a specific *regional-level* regulation measure. We construct regional-level regulation measures by aggregating firm-level regulation measures across firms in the same region and round. The aggregation takes two steps. First, we partial out the effect of basic firm characteristics ($\mathbf{X}_{ft}$) from regulation measures (R_{ft}) by taking residuals of the OLS regression: $R_{ft} = \lambda' \mathbf{X}_{ft} + \varepsilon_{ft}$. Second, we take simple averages of these residuals by region in each round of the survey: $\bar{R}_{rt} = \frac{1}{N} \sum_{f=1}^{N} \hat{R}_{ft}$, where N is the number of firms in each region*round.

The rest of the notation is as above. ξ is our coefficient of interest. Since it cannot be estimated by OLS because of reverse causality, we estimate it with 2SLS. The analysis presented in the Section 3 of the paper helps to identify the sources of exogenous variation in regulatory burden. We use the interactions of $AFTER$ with institutional measures I and with the initial level of regulatory environment as instruments. Inclusion of time and region fixed effects into the list of covariances is crucial for the validity of our instruments because both the regional institutions (I_r) and the time trend (collinear with $AFTER_t$) have a direct effect on the outcomes ($\bar{R}_{rt}$) and are correlated with the instruments ($I * AFTER$); time and region fixed effects control for the direct effects of institutions and time. The first stage

is as follows:

$$\bar{R}_{rt} = \alpha I_r * AFTER_t + \mu' \mathbf{Z}_{rt} + \phi_r + \rho_t + \varepsilon_{rt}. \tag{5}$$

As regulation measures, we take the average regional values of the frequency of sanitary inspections, number of illegitimate licenses, and the number of agencies needed for registration. We do not consider how the length of license validity and the time needed for registration affect the outcomes because institutions did not affect the reform progress in these areas (as shown in Section 3.2) and, therefore, we do not have instruments for them. Table A.3 in the appendix reports the first stage along with F-statistics for the excluded instruments. For registration and licensing, the instruments are sufficiently strong; whereas for inspections instruments are weak and, therefore, the second stage results for inspections may be biased due to the weak instruments problem (we use criteria for weak instruments from Stock, Wright and Yogo, 2002).

4.1 Results: the effect of deregulation on outcomes

First, let us consider the estimates of the effect of regulation on the net entry and employment of small businesses (presented in Panels A and B of Table 5, respectively). The table reports OLS and 2SLS estimates. 2SLS regressions (even columns) yield statistically significant negative effects of illegitimate licenses and the share of firms with frequent sanitary inspections on the net entry measured by the log number of small businesses. In addition, the share of firms that had to visit more than one agency in order to register and the share of firms with frequent sanitary inspections in a region have a significant negative effect on the small business employment as a share of population. The share of firms with more than one agency for registration in a region does not have a significant effect on net entry and the number of illegitimate licenses does not significantly affect employment.

In order to illustrate the direction and size of the bias in uninstrumented regressions, in addition to the results of the 2SLS estimation, we present OLS results (odd columns). In all regressions uninstrumented OLS estimates are larger that 2SLS estimates. This points

to a positive and rather large bias in the OLS estimates, which is consistent with the view that predatory regulators are attracted to the environments with more vibrant and growing business.[20]

The magnitude of the estimated effects of regulatory environment on entry and employment is very large. A one standard deviation increase in the share of firms with more than one agency needed for registration leads to a 14% (or 0.7 percentage point) lower regional employment by small businesses. A one standard deviation increase in the log number of illegitimate licenses per firm in a region leads to a 48% increase in the number of small businesses. A one standard deviation increase in the share of firms with more than one sanitary inspection in a region leads to a 57% lower number of small businesses and 46% (or 2.4 percentage points) lower per capita small business employment. As we already mentioned, the latter finding (about the effect of inspections) may be tenuous due to the weak-instrument problem. Despite the weak instruments, one can be confident of the direction of the effect since one expects a positive bias in the OLS estimate, while both the OLS and 2SLS regressions produce negative and significant coefficients for the effect of inspections on entry and small business employment.

The instruments used for different regulatory measures (i.e., the interaction terms of institutional determinants of reform progress and "after reform" dummy) are correlated with each other. Thus, the interpretation of the results requires a word of caution: the instruments do not allow us to distinguish between the effects of changes in different dimensions of regulation; instead, we estimate the causal effect of the whole cluster of regulations associated with registration, licensing, and inspections on the outcomes. Thus, the correct interpretation of the results in this section is that deregulation *in general* is beneficial for entry and small business growth.

Let us now turn to the estimation of the effect of regulation on pollution and morbidity.

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[20]Such endogeneity of regulation can explain why Klapper, Laeven and Rajan (2004) find that more benign entry regulations are not associated with higher entry in corrupt countries whereas there is a strong relationship in uncorrupt countries.

Under the assumption that registration procedures, licensing, and sanitary inspections aim at correcting such market failures as pollution externalities or provision of toxic goods by neglectful fly-by-night businesses, the public interest theory predicts a negative relationship between the level of these regulations, on the one hand, and pollution and morbidity, on the other. We find no empirical support for this. Panel A of Table 6 presents the regression results for emissions and Panel B—for morbidity. None of the estimated coefficients is statistically significant negative. For pollution, the coefficients of interest are negative but very imprecisely estimated; the same is true for one of the three coefficients in regressions for public health. The other two coefficients in regressions for public heath are positive (contrary to the prediction of public interest theory) and one is marginally significant. It is worth mentioning that there is no systematic relationship between OLS and 2SLS estimates: in registration and licensing regressions for public health, the OLS estimates are actually lower than 2SLS estimates. This is an additional piece of evidence against the public interest theory which predicts an upward bias in the OLS estimation. It is important to note, however, that the public health and pollution variables may be poorly measured and considered regulations may aim at curing other market failures; therefore, one should treat the evidence of no relationship between pollution and morbidity, on the one hand, and regulations, on the other hand, merely as suggestive.

5 Robustness

In this section, we describe various robustness checks for our baseline results.

Alternative institutional measures. We use the following two alternative measures of the strength of industrial lobbying, i.e., the industrial concentration of output and the state capture index. We also use several alternative measures of availability of independent sources of media: non-zero subscription to the only two independent (at that time) federal business newspapers Vedomosti and Kommersant, the presence of a signal of the largest independent radio station Echo Moscow in the area, and the media freedom index. State capture index

and media freedom index do not have a significant effect on the progress of reforms, whereas regressions with the rest of our alternative institutional measures produce results very similar to the reported results. The media freedom and the state capture indices, however, may be poorly measured because they are constructed on the basis of subjective perceptions of experts, unlike all other institutional measures that we use (with the exception of control over corruption); as a result, the coefficient estimates for regressions with these two measures may have an attenuation bias.

Region-specific linear trends. One could argue that, independently of deregulation reform, different regional institutional environments may be associated with different trends in regulation level. In order to make sure that our results are not driven by this relationship, we re-ran specifications 1, 2, and 3 with region-specific linear trends as additional regressors. The direction of the estimated effects remains the same (α coefficients remain negative), the magnitude of the effects decreases a little bit, but in the majority of regressions the coefficients of interest remain statistically significant. To be more precise, in Tables 2-4, we report forty regressions (eight regressions for each institutional measure) in which we find significant effect of considered institutions on the reform progress in 77.5% of the cases. Once we include region-specific linear trends, significance is preserved in 55% of all regressions. The most vulnerable to the inclusion of the region-specific trends turn out to be internet penetration and fiscal incentives, which remain significant in 2 and 3 out of 8 regressions, respectively. One should note that many of the alternative measures of access to independent media remain significant after controlling for region-specific trends. Overall, the results are qualitatively the same, but become somewhat weaker statistically with the inclusion of region-specific trends. This, however, is to be expected considering that we have only 6 time periods.

Reform timing. The results are robust to using the alternative assumption about the timing of the laws on inspections and licensing vis-à-vis the monitoring rounds. In reality, deregulation laws on inspections and licenses took place in the middle of the MABS rounds.

In this exercise, the benchmark level of regulation for inspections before the reform refers to the first half of 2001. To check robustness, we use the retrospective data about the number of inspections a year before each of the MABS rounds. This needs to be done for all the rounds because of a significant recall bias: firm managers tend to forget about inspections that took place a year ago and systematically understate their number. In the case of licensing, we assume that the reform started from the second round onwards. The results that we get under the alternative assumption about the timing are consistent, but somewhat weaker. In most cases, however, they remain significant.

Set of control variables. Our results do not depend on the inclusion of the regional control variables, i.e., population and income. Since we consider the regional-level enforcement of federal laws, one might argue that the variation in obedience of local governments to the federal center may explain some of our results. To check this, we re-ran regressions with the interaction of $AFTER$ with the dummy indicating whether the regional governor belongs to the governing "United Russia" party as an additional covariate. All results on government transparency and control over corruption become slightly stronger and the other results are unaffected. The progress of reform itself is also unaffected by whether the governor belongs to the governing party.

Additional measures of regulation. We repeat the analysis for an additional measure of regulatory burden – the average cost of obtaining one license. The results that we get qualitatively are very similar to those for other measures of regulation, but rarely statistically significant. This measure, however, is very noisy because it averages the costs of obtaining legitimate and illegitimate licenses. Since the reform affected only the cost of legitimate licenses, we do not use this measure in our baseline analysis. In addition, we repeat the analysis for all inspections (rather than just the sanitary inspection). The results become a lot weaker. Most of the variation in the number of inspections among regions, however, is in the most frequent inspection, i.e., sanitary.

Weights. In Table 2, we report results where we simply pool the samples of new and old

firms together; thus, there are four times as many old firms as new firms by construction of the MABS samples. To check robustness, we also applied equal weights for new and old firms and equal weights for each regulation type. In addition, we took averages of firm-level observations for each of the five dimensions of regulation in each region and round and re-ran Equation 1. In all cases, the results are robust: Both the direction and statistical significance of the effects is preserved; while their magnitude increases.

Overall, our results prove to be robust.

6   Conclusions

We analyze firm-level panel data on the regulatory burden of firms in Russia during a period of a drastic deregulation reform. Our findings are as follows. On average, the deregulation reform significantly lowered the actual regulatory burden on Russian firms; the reform progress, however, exhibited a vast regional variation. Five institutional factors had a robust, statistically significant, and economically strong effect on the implementation of deregulation reform in the Russian regions: government transparency, control over corruption, internet penetration and the access to other independent sources of media, the presence of strong industrial lobby, and strong fiscal incentives. These factors are associated with a better reform progress both in the regulations of entry and regulations of businesses already in operation. Using the interaction between the timing of reform and the determinants of its success as exogenous sources of variation in regulatory burden, we show that deregulation had a large significant positive causal effect on SME entry and employment and had no (adverse) effect on pollution and public health.

This evidence is inconsistent with the public interest theory and is fully consistent with the public choice theory and, in particular, tollbooth theory of the nature of regulation (de Soto, 1990; Shleifer and Vishny, 1993; Djankov et al., 2002): regions with transparent, accountable and least corrupt governments as well as more informed populations are the ones that achieve better progress in deregulation.

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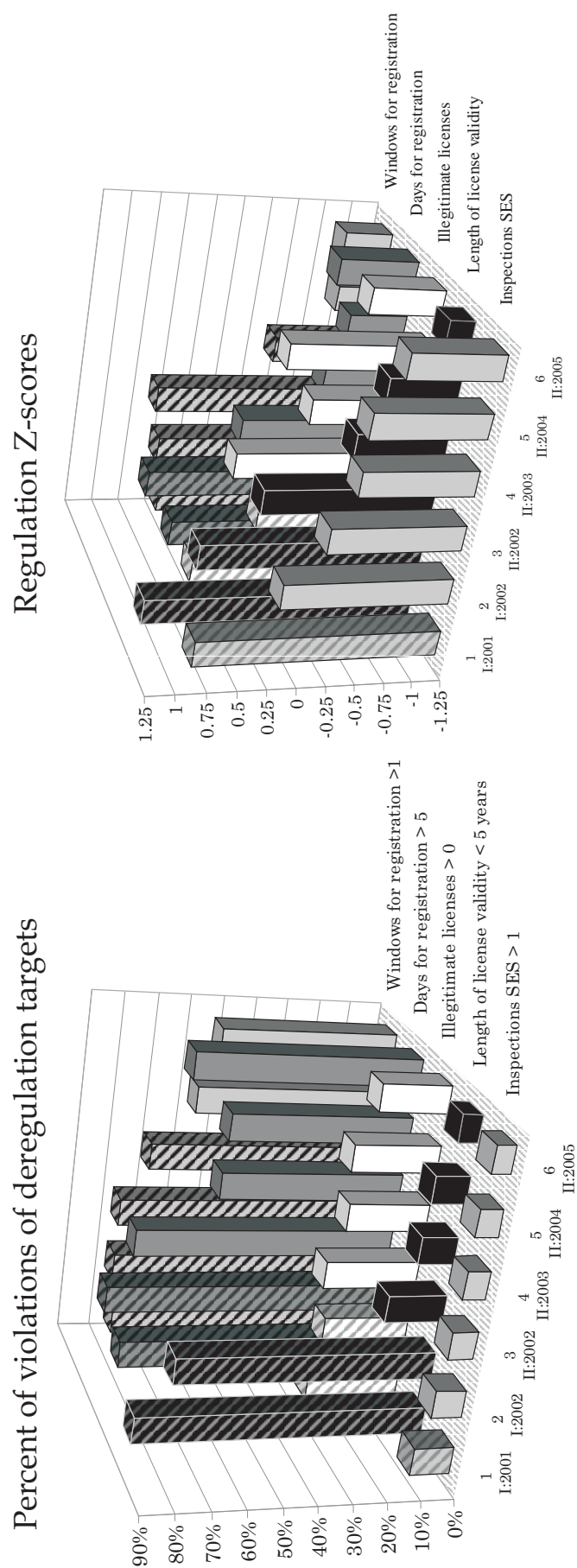
Figure 1: The Level of Violation of Deregulation Targets (left) and the Level of Regulation (right) Striped Columns Indicate Time Before Reform (specific for each area of regulation)

Figure 2: Regional Variation in Deregulation

Regions: 1-Komi Republic, 2-Altaisky Krai, 3-Krasnoyarsky Krai, 4-Primorsky Krai, 5-Khabarovsky Krai, 6-Amurskaya Oblast, 7-Kaluzhskaya Oblast, 8- Kurganskaya Oblast, 9-Moskovskaya Oblast, 10-Nizhegorodskaya Oblast, 11-Novosibirskaya Oblast, 12-Permskaya Oblast, 13-Rostovskaya Oblast, 14-Samarskaya Oblast, 15- Saratovskaya Oblast, 16-Sakhalinskaya Oblast, 17-Smolenskskaya Oblast, 18-Chelyabinskaya Oblast, 19-Moscow City, 20- St.Petersburg City. "X" denotes missing data.
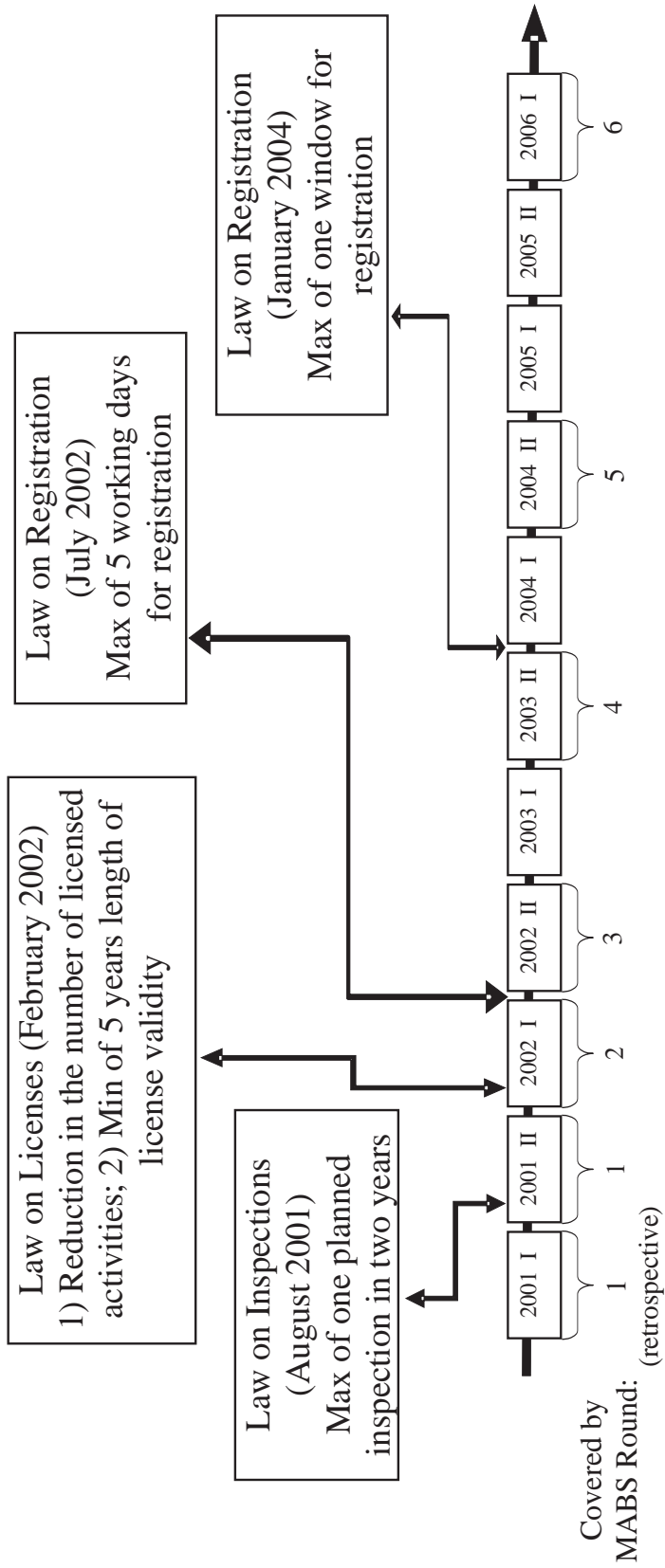
Figure 3: The Timing and Content of Deregulation Reform and Rounds of MABS Survey

Table 1: The List of Variables Measuring Regulatory Burden

	Variable:	Abbreviated name:	V
Panel A: Inspections	Log (number of sanitary inspections in six months)	log number of inspections	V
	Dummy for more than one sanitary inspection in six months	more than one sanitary inspection	V
Panel B: Licensing	Log (number of illegitimate licenses the firm has)	log number of illegitimate licenses	V
	Dummy for presence of an illegitimate license	at least one illegitimate license	V
	Negative of Log (term of license validity for the legitimate licenses)	minus log term of license validity	V
	Dummy for less than 5-year-term of license validity for a legitimate license	too short term of license validity	V
Panel C: Registration	Log (number of agencies needed for registration)	log number of windows for registration	V
	Dummy for more than one agency for registration	more than one window for registration	V
	Log (days for registration)	log days for registration	V
	Dummy for more than a week for registration	more than one week to register	V
Panel D: Overall regulatory burden	Overall level of regulation:	regulation level	
	Panel of Z-scores for the number of illegitimate licenses, minus term of license validity, the number of sanitary inspections, the number of days for registration, and the number of windows for registration		
	Overall level of violation of deregulation targets:	violation of deregulation targets	
	Panel of dummies indicating too short license validity, an illegitimate license, more than one sanitary inspection, more than one week to register, and more than one window for registration		

Note: "V" labels dummy variables indicating whether there is a violation of a specific target in one of the deregulation laws. We take the negative of the length of license validity variable in order to have all the effects go in the same direction, i.e., higher values of all regulatory measures mean higher regulatory burden.

Table 2: The Overall Regulation Level, Reform, and Institutions

	1	2	3	4	5	6	7	8	9	10
	Violation of deregulation targets						Regulation level			
AFTER	-0.24	-0.24	-0.26	-0.24	-0.24	-0.20	-0.20	-0.21	-0.20	-0.20
	[0.02]***	[0.02]***	[0.02]***	[0.02]***	[0.02]***	[0.05]***	[0.05]***	[0.06]***	[0.05]***	[0.05]***
Transparency * AFTER	-0.006					-0.015				
	[0.002]***					[0.003]***				
Internet * AFTER		-0.005					-0.013			
		[0.004]					[0.006]**			
Corruption cont. * AFTER			-0.132					-0.163		
			[0.075]*					[0.152]		
Ind. concentr * AFTER				-0.224					-0.616	
				[0.097]**					[0.231]***	
Fiscal incentives * AFTER					-0.175					-0.502
					[0.079]**					[0.161]***
Initial regulation * AFTER	-0.90	-0.90	-0.92	-0.90	-0.91	-0.81	-0.83	-0.97	-0.82	-0.86
	[0.04]***	[0.04]***	[0.05]***	[0.04]***	[0.04]***	[0.09]***	[0.09]***	[0.12]***	[0.10]***	[0.09]***
Log (population)	0.08	0.05	-0.02	-0.06	0.04	0.47	0.40	0.21	0.14	0.41
	[0.08]	[0.11]	[0.09]	[0.08]	[0.09]	[0.23]**	[0.26]	[0.27]	[0.24]	[0.23]*
Log (mean pc income)	0.01	0.01	-0.03	0.00	-0.02	0.04	0.04	-0.07	0.03	-0.05
	[0.03]	[0.03]	[0.03]	[0.04]	[0.03]	[0.07]	[0.07]	[0.08]	[0.08]	[0.07]
Firms age	-0.001	-0.001	-0.002	-0.001	-0.001	0.01	0.01	0.02	0.01	0.01
	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.009]	[0.009]	[0.010]*	[0.009]	[0.009]
Firms size	0.05	0.05	0.06	0.05	0.05	0.14	0.14	0.16	0.14	0.14
Firms size squared	-0.003	-0.003	-0.005	-0.003	-0.003	-0.006	-0.006	-0.008	-0.006	-0.007
	[0.002]*	[0.002]*	[0.002]**	[0.002]*	[0.002]*	[0.006]	[0.006]	[0.007]	[0.006]	[0.006]
New firm dummy	0.133	0.133	0.13	0.132	0.134	0.018	0.019	0.004	0.016	0.021
	[0.03]***	[0.03]***	[0.03]***	[0.03]***	[0.03]***	[0.07]	[0.07]	[0.09]	[0.07]	[0.07]
Region*Regulation FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Round FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry and Legal form	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	25 026	25 026	19 600	25 026	25 026	24 640	24 640	19 334	24 640	24 640
Regions*Regulations	99	99	79	99	99	99	99	79	99	99
R-squared	0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.07	0.06	0.06

Note: Robust standard errors adjusted for clusters at the level of the region * each of the three regulation types (licensing, inspections, registration) are in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 3: Specific Regulations and Institutions: Panel of Old Firms with Firm Fixed Effects

	1	2	3	4	5	6	7	8	9	10
	At least one illegitimate license					More than one sanitary inspection				
Transparency * AFTER	-0.007 [0.002]***					-0.003 [0.002]*				
Internet * AFTER		-0.008 [0.003]**					-0.004 [0.002]**			
Corruption cont. * AFTER			-0.129 [0.066]**					-0.033 [0.046]		
Ind. concentr * AFTER				-0.313 [0.112]***					-0.161 [0.067]**	
Fiscal incentives * AFTER					-0.08 [0.079]					-0.119 [0.049]**
Initial regulation * AFTER	-0.64 [0.03]***	-0.64 [0.03]***	-0.63 [0.03]***	-0.64 [0.03]***	-0.65 [0.03]***	-0.78 [0.03]***	-0.78 [0.03]***	-0.79 [0.03]***	-0.78 [0.03]***	-0.78 [0.03]***
Log (population)	0.25 [0.17]	0.38 [0.20]*	0.10 [0.19]	0.06 [0.16]	0.15 [0.17]	0.17 [0.14]	0.06 [0.13]	0.15 [0.16]	0.11 [0.14]	0.17 [0.14]
Log (mean pc income)	0.082 [0.057]	0.107 [0.060]*	0.070 [0.064]	0.078 [0.057]	0.057 [0.059]	-0.005 [0.038]	0.011 [0.040]	-0.004 [0.046]	-0.007 [0.038]	-0.023 [0.039]
New firm dummy	-0.36 [0.04]***	-0.34 [0.04]***	-0.001 [0.001]	-0.35 [0.04]***	-0.34 [0.04]***					
Firms age	-0.003 [0.013]	-0.002 [0.013]	-0.001 [0.015]	-0.003 [0.013]	-0.003 [0.013]	-0.005 [0.009]	-0.005 [0.009]	-0.002 [0.010]	-0.005 [0.009]	-0.004 [0.009]
Firms size	0.08 [0.04]**	0.08 [0.04]**	0.10 [0.04]**	0.08 [0.04]**	0.08 [0.04]**	0.03 [0.02]	0.02 [0.02]	0.04 [0.03]	0.03 [0.02]	0.03 [0.02]
Firms size squared	-0.009 [0.007]	-0.009 [0.007]	-0.012 [0.008]	-0.009 [0.007]	-0.009 [0.007]	-0.001 [0.005]	-0.001 [0.005]	-0.004 [0.006]	-0.001 [0.005]	-0.001 [0.005]
Firm's FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Round FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry and Legal form	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7 290	7 290	6 503	7 290	7 290	5 305	5 280	4 569	5 305	5 305
R-squared	0.12	0.12	0.11	0.12	0.12	0.29	0.30	0.30	0.29	0.29
Number of firms	2 270	2 270	2 215	2 270	2 270	1 522	1 516	1 518	1 522	1 522

Note: Robust standard errors adjusted for clusters at the firm level in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. There are no statistically significant results for the effect of institutions on reform progress in increasing the length of license validity.

Table 4: Specific Regulations and Institutions: Repeated Cross-section with Regional Fixed Effects

Panel A

	1	2	3	4	5	6	7	8	9	10
	More than one sanitary inspection, old firms					At least one illegitimate license, old firms				
Transparency * AFTER	-0.004 [0.001]***					-0.004 [0.001]***				
Internet * AFTER		-0.002 [0.002]					-0.006 [0.002]***			
Corruption cont. * AFTER			0.029 [0.042]					-0.109 [0.039]***		
Ind. concentr * AFTER				-0.128 [0.050]**					-0.097 [0.054]*	
Fiscal incentives * AFTER					-0.113 [0.046]**					-0.091 [0.049]*
Initial regulation * AFTER	-0.54 [0.100]***	-0.53 [0.108]***	-0.41 [0.161]**	-0.53 [0.110]***	-0.58 [0.112]***	-0.62 [0.125]***	-0.58 [0.131]***	-0.62 [0.154]***	-0.57 [0.126]***	-0.65 [0.127]***
Region and Round FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm and Region controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8 969	8 969	7 427	8 969	8 969	9 085	9 085	7 826	9 085	9 085
R-squared	0.09	0.09	0.1	0.09	0.09	0.05	0.05	0.05	0.05	0.05

Panel B

	11	12	13	14	15	16	17	18	19	20
	More than one window for registration, new firms					At least one illegitimate license, new firms				
Transparency * AFTER	-0.023 [0.011]**					-0.009 [0.004]**				
Internet * AFTER		-0.037 [0.022]*					-0.015 [0.006]**			
Corruption cont. * AFTER			-0.177 [0.222]					-0.011 [0.105]		
Ind. concentr * AFTER				-0.934 [0.314]***					-0.478 [0.190]**	
Fiscal incentives * AFTER					-0.815 [0.314]**					0.108 [0.113]
Initial regulation * AFTER	-0.84 [0.25]***	-0.67 [0.24]***	-0.83 [0.24]***	-0.63 [0.25]**	-0.67 [0.23]***	-0.86 [0.13]***	-0.88 [0.14]***	-0.79 [0.14]***	-0.77 [0.12]***	-0.84 [0.14]***
Region and Round FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm and Region controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	812	812	754	812	812	2 031	2 031	1 718	2 031	2 031
R-squared	0.2	0.2	0.21	0.2	0.2	0.08	0.08	0.08	0.09	0.08

Note: Robust standard errors adjusted for clustered at the level of the region*round in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%. There are no statistically significant results for the effect of institutions on reform progress in shortening the length of registration procedures.

Table 5: Regulation and Small Business

Panel A: Regulation and (Net) Entry
Dependent variable - log of total number of small businesses

	1 OLS	2 2SLS	3 OLS	4 2SLS	5 OLS	6 2SLS
More than one window for registration	0.022 [0.081]	-0.182 [0.193]				
Log (number of illegitimate licenses)			0.078 [0.212]	-0.872 [0.480]*		
More than one sanitary inspection					-0.7 [0.413]*	-2.122 [0.918]**
Log (population)	0.812 [0.870]	0.615 [1.009]	0.134 [0.381]	0.275 [0.344]	0.192 [0.374]	0.287 [0.274]
Log (mean pc income)	0.033 [0.166]	-0.05 [0.199]	0.021 [0.150]	-0.067 [0.165]	0.01 [0.146]	0.001 [0.162]
Round and Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	84	84	99	99	99	99
R-squared, within	0.13		0.07		0.1	
F-stat for instruments (1st stage)		14.5		9.0		6.5

Panel B: Regulation and Small Business Employment
Dependent variable - total employment in small business per capita

	7 OLS	8 2SLS	9 OLS	10 2SLS	11 OLS	12 2SLS
More than one window for registration	-0.008 [0.003]**	-0.016 [0.008]**				
Log (number of illegitimate licenses)			0.018 [0.011]*	0.001 [0.036]		
More than one sanitary inspection					-0.036 [0.021]*	-0.09 [0.042]**
Log (population)	-0.041 [0.033]	-0.049 [0.034]	-0.097 [0.019]***	-0.094 [0.028]***	-0.092 [0.019]***	-0.088 [0.026]***
Log (mean pc income)	0.001 [0.006]	-0.002 [0.007]	0.005 [0.007]	0.003 [0.007]	0.003 [0.007]	0.002 [0.006]
Round and Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	84	84	99	99	99	99
R-squared, within	0.44		0.4		0.4	
F-stat for instruments (1st stage)		14.5		9.0		6.5

Note: Robust standard errors in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 6: Regulation, Pollution and Public Health

Panel A: Regulation and Pollution
Dependent variable - log emissions of contaminants into the atmosphere

	1 OLS	2 2SLS	3 OLS	4 2SLS	5 OLS	6 2SLS
More than one window for registration	0.009 [0.098]	-0.088 [0.222]				
Log (number of illegitimate licenses)			0.217 [0.251]	-1.27 [0.815]		
More than one sanitary inspection					-0.521 [0.499]	-0.924 [1.169]
Log (population)	1.71 [1.048]	1.616 [1.182]	0.417 [0.452]	0.638 [0.440]	0.511 [0.273]*	0.501 [0.266]*
Log (mean pc income)	-0.354 [0.200]*	-0.394 [0.227]*	-0.256 [0.178]	-0.394 [0.290]	-0.282 [0.197]	-0.281 [0.196]
Round and Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	84	84	99	99	99	99
R-squared, within	0.99		0.08		0.08	
F-stat for instruments (1st stage)		14.46		9		6.5

Panel B: Regulation and Public Health
Dependent variable - morbidity from injuries and poisoning per 1,000 people

	7 OLS	8 2SLS	9 OLS	10 2SLS	11 OLS	12 2SLS
More than one window for registration	0.20 [2.04]	2.47 [4.15]				
Log (number of illegitimate licenses)			-3.12 [5.34]	22.77 [12.06]*		
More than one sanitary inspection					-8.20 [10.61]	-14.37 [40.11]
Log (population)	-63.3 [21.9]***	-61.2 [20.9]***	-87.9 [9.6]***	-91.7 [7.5]***	-87.8 [9.6]***	-87.4 [7.9]***
Log (mean pc income)	-8.4 [4.2]*	-7.4 [3.8]**	-7.5 [3.8]*	-5.1 [3.4]	-7.2 [3.8]*	-7.3 [3.3]**
Round and Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	84	84	99	99	99	99
R-squared, within	0.98		0.61		0.61	
F-stat for instruments (1st stage)		14.46		9		6.5

Note: Robust standard errors in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%.

A Appendix: Data on Institutions

Summary statistics for all institutional measures are presented in Panel B of Table A.1.

The measures of local accountability

Government transparency: The regional indices of government transparency come from an independent informational agency "Strana.ru" and an independent association of journalists "Media Soyuz." In the paper, we report results for the overall transparency of authorities; the results using the other measures of government transparency are very similar. These indices were constructed on the basis of a survey of more than a thousand prominent regional journalists who were asked to evaluate performance of the regions along the following dimensions: accessibility and accuracy of information about decisions of a particular regional authority, impartiality and easiness of journalist accreditation rules, quickness of response on journalist inquiries, presence and quality of internet site, etc. The transparency ratings are available at www.strana.ru/print/128316.html.

Corruption: An index of regional corruption was constructed by Transparency International jointly with the Information for Democracy foundation (INDEM) on the basis of a an opinion survey among regionally-representative samples of managers of small and medium-size firms and of population about their perceptions of corruption. As our measure of control over corruption we take (1-"corruption volume"), with "corruption volume" variable available at www.anti-corr.ru/rating_regions/index.htm.

Independent media sources: We use several alternative measures of the access of the public to independent media. First, the internet penetration variable — the number of personal computers connected to internet per 100 employees — comes from the official Russia's statistical agency (Rosstat). Second, we use a dummy that indicates regions with non-zero subscription to the two main independent (in 2000) daily newspapers — *Kommersant* and *Vedomosti*. These data come from their respective websites, www.kommersant.ru and www.vedomosti.ru. Third, we use a dummy for availability of the signal in the region of the largest independent radio station — *Echo Moscow*. These data come from the radio's website, www.echo.msk.ru. Fourth, we also take an index of regional media freedom collected and published by the nongovernmental organization "Public Expertise," which measures restrictions in regional legislation on information dissemination through the media. This rating can be found at www.freepress.ru/arh_e.shtml. As a baseline, we report results with internet penetration; the results for the Vedomosti and Kommersant subscriptions and for the Echo Moscow coverage are very similar to the results for internet penetration. We have no significant results for the media freedom index.

The measures of industrial lobbying

We use three alternative variables to proxy for the political power of industry incumbents. Each of these proxies is imperfect. Yet, even though they are constructed in different ways and from different data sources, they are correlated and produce similar results. Thus, we are reasonably confident that these measures pick up the effect of lobbying by politically-powerful firms. The first two measures are the concentration (Herfindahl-Hirschman) indices of sales and of employment among industrial firms in each region. The logic behind the choice of industrial concentration as proxy for the strength of industrial lobbying is as in Grossman and Helpman (1994). The source of these data is the Russia's Industrial Registry. The third proxy is a measure of regional regulatory capture constructed by and described in Slinko, Yakovlev and Zhuravskaya (2005). This is the concentration of preferential treatments (i.e., subsidies, tax breaks, etc.) given to large firms in each region by the regional laws and regulations. This variable reflects the extent to which political power is concentrated in the hands of a few large firms. In the paper, we report results using the HHI of employment, but the results using other proxies are similar.

The measure of fiscal incentives

The share of own budgetary revenues in the total regional budget is used as a simple (and rather crude) proxy for the regional fiscal incentives. The data come from the Treasury of the Russian Federation (www.roskazna.ru/reports/mb.html).

Table A.1: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Panel A: Regulation measures					
Log number of sanitary inspections	9046	0.222	0.442	0	3.932
More than one sanitary inspection	9046	0.080	0.271	0	1
Log number of illegitimate licenses	11246	0.241	0.554	0	5.889
Presence of illegitimate licenses	11246	0.216	0.412	0	1
Log number of windows for registration	827	1.390	0.558	0	3.045
More than one window for registration	827	0.703	0.457	0	1
Too short term of license validity	5058	0.336	0.472	0	1
Minus log (term of license validity)	5058	-3.606	0.625	-5.889	-0.693
Log days for registration	820	2.711	0.843	0.262	5.903
More than one week to register	850	0.729	0.445	0	1
Overall regulation level (z-scores)	24842	0	1	-2.612	4.863
Overall violations of the law	25250	0.2413	0.4279	0	1
Panel B: Institutional determinants					
Overall transparency of regional authorities	20	7.478	4.014	0.060	15.860
Transparency of executive power	20	4.224	2.248	0.030	8.750
Transparency of legislative power	20	3.254	1.872	0.030	7.110
Transparency of courts	20	2.221	1.615	0.090	6.940
Control over corruption	16	0.358	0.154	0.087	0.669
Concentration of industrial output	20	0.219	0.099	0.122	0.528
Concentration of industrial employment	20	0.178	0.077	0.110	0.385
Concentration of preferential treatments	20	0.535	0.238	0.209	0.907
Internet penetration	20	4.808	3.181	1.800	16.000
Radio Echo Moskvi, signal coverage	20	0.600	0.503	0	1
Vedomosti daily, subscription	20	0.550	0.510	0	1
Kommersant daily, subscription	20	0.450	0.510	0	1
Media freedom index	20	42.040	12.650	18	75
Share of own revenues	20	0.829	0.117	0.592	0.959
Governor from the governing party	20	0.721	0.413	0	1
Panel C: Outcomes					
Share of SME employment per capita	99	0.053	0.037	0.019	0.200
Log number of small businesses	99	2.560	1.135	0.875	5.282
Log emissions of contaminants	99	5.152	1.172	2.425	7.859
Morbidity from injuries and poisoning per 1000	99	92.085	18.352	54.100	129.000

Table A.2: Account of results for all specific regulation measures

Institution:	Variable:	Panel of firms		X-section of firms	
		Coef	SE	Coef	SE
Transparency	more than one sanitary inspection	-0.003	[0.002]*	-0.004	[0.001]***
	log number of sanitary inspection	0.002	[0.002]	-0.004	[0.002]**
	log number of illegitimate licenses	-0.006	[0.002]***	-0.008	[0.003]**
	presence of illegitimate licenses, old firms	-0.007	[0.002]***	-0.004	[0.001]***
	presence of illegitimate licenses, new firms			-0.009	[0.004]**
	minus log term of license validity	0.002	[0.002]	-0.003	[0.004]
	too short length of license validity	0.000	[0.004]	0.001	[0.003]
	log number of windows for registration			-0.014	[0.014]
	more than one window for registration			-0.023	[0.011]**
	log number of days for registration			0.045	[0.023]*
	more than 5 days for registration			0.017	[0.011]
Internet	more than one sanitary inspection	-0.004	[0.002]**	-0.002	[0.002]
	log number of sanitary inspection	0.003	[0.003]	0	[0.002]
	log number of illegitimate licenses	-0.008	[0.003]**	-0.01	[0.005]**
	presence of illegitimate licenses, old firms	-0.008	[0.003]**	-0.006	[0.002]***
	presence of illegitimate licenses, new firms			-0.015	[0.006]**
	minus log term of license validity	0.006	[0.005]	-0.002	[0.008]
	too short length of license validity	-0.003	[0.004]	0.009	[0.005]*
	log number of windows for registration			-0.016	[0.026]
	more than one window for registration			-0.037	[0.022]*
	log number of days for registration			0.05	[0.056]
	more than 5 days for registration			0.055	[0.017]***
Corruption cont.	more than one sanitary inspection	-0.033	[0.046]	0.028	[0.043]
	log number of sanitary inspection	-0.111	[0.059]*	-0.092	[0.046]**
	log number of illegitimate licenses	-0.041	[0.068]	-0.175	[0.085]**
	presence of illegitimate licenses, old firms			-0.109	[0.039]***
	presence of illegitimate licenses, new firms	-0.129	[0.066]**	-0.011	[0.105]
	minus log term of license validity	0.049	[0.106]	0.229	[0.122]*
	too short length of license validity	-0.071	[0.069]	0.072	[0.074]
	log number of windows for registration			-0.129	[0.285]
	more than one window for registration			-0.177	[0.222]
	log number of days for registration			-0.493	[0.348]
	more than 5 days for registration			0.234	[0.205]
Ind. concentration	more than one sanitary inspection	-0.161	[0.067]**	-0.118	[0.050]**
	log number of sanitary inspection	-0.017	[0.088]	-0.204	[0.065]***
	log number of illegitimate licenses	-0.315	[0.113]***	-0.474	[0.209]**
	presence of illegitimate licenses, old firms	-0.313	[0.112]***	-0.097	[0.054]*
	presence of illegitimate licenses, new firms			-0.478	[0.190]**
	minus log term of license validity	-0.071	[0.158]	-0.165	[0.180]
	too short length of license validity	-0.067	[0.085]	-0.192	[0.179]
	log number of windows for registration			-0.732	[0.454]
	more than one window for registration			-0.934	[0.314]***
	log number of days for registration			-0.45	[0.722]
	more than 5 days for registration			0.7	[0.497]
Fiscal incentives	more than one sanitary inspection	-0.119	[0.049]**	-0.104	[0.046]**
	log number of sanitary inspection	-0.082	[0.062]	-0.176	[0.054]***
	log number of illegitimate licenses	-0.067	[0.084]	-0.217	[0.102]**
	presence of illegitimate licenses, old firms	-0.08	[0.079]	-0.091	[0.049]*
	presence of illegitimate licenses, new firms			0.108	[0.113]
	minus log term of license validity	-0.098	[0.124]	-0.107	[0.126]
	too short length of license validity	-0.046	[0.073]	-0.03	[0.091]
	log number of windows for registration			-0.572	[0.335]*
	more than one window for registration			-0.815	[0.314]**
	log number of days for registration			0.367	[0.560]
	more than 5 days for registration			-0.162	[0.279]

Table A.3: The first stage

	More than one window for registration	Log(number of illegitimate licenses)	More than one sanitary inspection
Fiscal Incentives * AFTER	-1.479		
	[0.389]***		
Transparency * AFTER		-0.01	-0.006
		[0.003]***	[0.003]*
Initial regulation * AFTER			-0.542
			[0.166]***
Log (population)	-0.169	0.373	0.138
	[1.279]	[0.213]*	[0.101]
Log (mean pc income)	-0.612	-0.055	-0.003
	[0.242]**	[0.079]	[0.039]
Round FE	Yes	Yes	Yes
Region FE	Yes	Yes	Yes
Observations	84	99	99
R-squared	0.62	0.53	0.71
F-stat for excluded instruments	14.5	9.0	6.5

Note: Robust standard errors in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%. The choice of a particular set of instruments is guided by maximization of the F-statistic for the excluded instruments.