

FISCAL GAMES AND PUBLIC EMPLOYMENT:  
A THEORY WITH EVIDENCE FROM RUSSIA

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## ABSTRACT

Why do some governments—in different countries and regions within them—employ more workers than others? Existing theories, which focus on the level of economic development, political redistribution, and social insurance may help to explain this. But they raise additional puzzles, do not fit all evidence, and fail to account for a global trend toward public employment decentralization. We propose a new theory, inspired by Russia's recent experience, that locates one motive for subnational public employment growth in a political and fiscal game between central and subnational governments. In countries with weak legal systems, local and regional officials may deliberately set their employment levels beyond their fiscal capacity, prompting bailouts from the central government, which fears the political cost to it if wage arrears accumulate and provoke strikes. We model the logic of such brinkmanship, derive several propositions, and show that they—and the model's assumptions—fit empirical evidence from Russia in the 1990s. Deficiencies of that country's overstuffed, underequipped, irregularly paid, ineffective, and strike-prone public sector appear to result in part from a system of dysfunctional incentives created by the way electoral pressures interact with the system of fiscal federalism. We suggest parallels with Latin American countries such as Argentina and Brazil.

## I. Introduction

Why do some governments employ so many more workers than others? As the role of government has expanded dramatically in countries across the globe, explaining the growth of public sector employment has become a key challenge for political economists. Huge differences have emerged among individual countries and among regions within the same country. In the early 1990s civilian government employment ranged from less than two percent of the labor force in Senegal to almost 35 percent in Sweden.<sup>1</sup> Even within relatively homogeneous clusters of countries, variation is quite extreme. Sweden's third of the work force in public sector jobs compares to about one twelfth of the workforce in Germany, while within Africa, Senegal's 1.8 percent is dwarfed by Botswana's 16.6 percent.

Levels of public employment also vary across the regions or municipalities that make up a given country. In Italy's South, for instance, public employees made up almost one quarter of the work force in 1995, compared to about 12 percent in the country's North.<sup>2</sup> Among cities in the US, 8.7 percent of the population of Jackson, Tennessee, were government employees in 1991; in Highland, California, the figure was only .05 percent.<sup>3</sup>

A number of theories have emerged to explain such variation across and within nations. Wagner's law—the argument that economic development engenders demands for new types of government services—is a common starting point.<sup>4</sup> Economic development clearly correlates cross-nationally with larger public sectors, measured in terms of either spending or manpower.<sup>5</sup> A second view casts public employment as a means by which politicians conceal redistribution in favor of specific groups. Alesina and colleagues argue that, for this reason, public employment should be higher where income inequality or ethnic diversity is greater.<sup>6</sup> Third, various scholars view government spending as a type of insurance against adverse economic conditions,<sup>7</sup> and public employment as one way to buffer the population against private sector unemployment.<sup>8</sup> This argument was developed to explain an observed link between large public sectors and exposure to foreign trade, but its implications

are more general.<sup>9</sup>

These theories may well explain part of the variation. However, in some respects they raise as many questions as they answer. If public sector overstaffing is a way that officials cushion the impact of the business cycle or trade-related dislocations, why do officials choose such an inefficient method? Retraining or transfer schemes would be far more cost-effective, whether the politicians' goal is to insure vulnerable workers or to buy votes. If the objective of public employment is to disguise flows of patronage, why should such patronage flows correlate with the degree of ethnic division or income inequality? Is patronage unique to ethnically or economically divided societies? If so, why would countries containing a larger number of ethnic groups have more patronage than those containing just two? The standard arguments associating income inequality with greater redistribution assume that it is the *majority* that exploits its democratic advantage to redistribute to itself.<sup>10</sup> But if it is the majority that redistributes to itself, it has no need to deceive the voters with complicated disguises. On the contrary, officials will *want* the majority to know they are redistributing in its favor. If, by contrast, the goal is to redistribute to a minority, there is no obvious reason why this should occur more where inequality is higher.

In other ways, existing theories do not seem to account for all the relevant facts. Wagner's law works well in explaining public employment levels across countries, but not always so well within them. In Argentina, Italy, and various other countries, poorer regions tend to have higher levels of public employment.<sup>11</sup> In the US, staffing levels of city governments did not correlate with per capita income in the 1990s.<sup>12</sup> None of the theories provides a clear rationale for another noted trend in public employment in the 1980s—a relative growth of employment at subnational levels, alongside shrinking at the center.<sup>13</sup> Schiavo-Campo and colleagues find that in the 1980s and early 1990s local and regional employment in government administration rose in Asia, Latin America, and the OECD, while central government employment fell. In dozens of countries around the world, public employment appears to be decentralizing. Why?

We propose a new theory that helps to account for this, as well as for some other

anomalous facts such as the accumulation of public sector wage arrears in various developing countries. Although inspired by Russia's experience in the 1990s, we believe a similar logic can be detected in other countries such as Ukraine, Brazil and Argentina.<sup>14</sup> The theory sees one impulse for public employment growth in a fiscal game that occurs between central and local officials in democracies with weak legal and administrative systems. Poorly structured institutions create incentives for local, regional, and sectoral actors to increase staff and delay paying wages. Subnational politicians can use revenues to provide public services and patronage to constituents or to pay the wages of local government employees. If courts do not reliably force them to pay wages on time, such officials will deliberately run up some level of wage arrears. The cost of delaying wages is that this may provoke public sector strikes, which erode the politicians' support. But often the blame for such strikes can be shifted in part onto the central government, which therefore comes under pressure to bail out the delinquent local government. By diverting revenues to other uses and exacerbating the risk of strike, the local government extracts larger fiscal transfers from the central government, part of which it uses to pay off wage arrears, but part of which goes toward hiring yet more public employees. Over time, such pressures would lead to sustained growth of the subnational public sector, alongside tightening fiscal constraints on the central government.<sup>15</sup>

It might seem odd that voters would blame the central government in part for a strike that the local government provokes by not paying the wages of its employees. But since the central government can—and at equilibrium, often does—provide transfers that avert such strikes, there is a certain logic to blaming it when it chooses not to do so. Voters in one region denied a bailout would quite rationally feel slighted when the center bails out a neighboring region. For voters to punish the central government for not providing such transfers is also strategically rational: the greater the share of the blame voters attribute to the central government, the larger the central transfers they will receive at equilibrium. Evidence from surveys suggests that many voters in Russia in the 1990s did blame central government for wage arrears that were formally the responsibility of regional governments.

In section II, we present a model that formalizes this logic. The theory is most suited

to analysis of federal states, but it can also apply to unitary states in which subnational governments control their own budgets and can hire public employees at their discretion. It is complementary in some ways to existing theories, but in other ways conflicts with them. For instance, in many countries decentralization of public service responsibilities—and, with them, public employment—has been a deliberate policy in recent years, motivated by an enthusiasm for decentralization among development economists and public finance specialists. We certainly do not claim that our theory accounts for all such change. We do believe, however, that a fiscal game similar to the one we model has been one important factor in a number of developing countries, most notably Russia.

In section III, we describe the evolution of public employment in Russia in the 1990s. Despite a massive privatization of state enterprises, the rapid collapse of government revenues, and staffing levels in public services such as health and education that were higher than those in the US or Germany, total public employment remained surprisingly stable. At the same time, federal employment at the center shrank while regional employment expanded. We then use multivariate regression to show that the pattern of regional growth fits a number of predictions of our theory. Larger central transfers led to higher public employment levels. (The definition of public employment used is employment in education, culture, art, science, healthcare, sport, social protection, and public administration. For more details and a discussion of alternative definitions, see section III.A below.) The impact of increases in federal transfers on public employment was greater than that of equal increases in regions' own revenues. Public employment tended to fall after a new governor had been elected and presumably trimmed the patronage appointments of his predecessor. Governors from the Communist opposition, who had a greater ideological commitment to high public employment or a greater confidence that they could divert blame for public sector strikes onto the central government, oversaw relatively faster growth of regional payrolls. We also provide a variety of evidence that the mechanism we describe—overstaffing leading to wage arrears, which increase the risk of strike, and therefore prompt federal aid—fits the experience of Russia in the 1990s. Section V concludes.

## II. Fiscal Politics and Public Employment: A Model

We model the fiscal politics that determines public employment levels as a two-stage game played between regional and central officeholders. While the game is clearly repeated, we focus on a single round since political actors are unlikely to stay in office for more than a few fiscal cycles, and so equilibria that require a long time horizon seem implausible. Politicians in this model seek to maximize their expected share of votes in the next election.<sup>16</sup> Public employment furthers this objective in three ways—as an ingredient of popular public services, as a conduit for patronage, and as a means of injecting into the state machinery loyal partisans who will be useful for organizing a reelection campaign and providing the incumbent with political information. For tractability, we set up the model as though separate public employees provide public services, on the one hand, and consume patronage or furnish partisan services, on the other, but this is merely a convenient stylization which should not affect results.

A country is composed of  $n$  regions, subscripted  $i$ , each with an elected governor, and each containing the same number of voters.<sup>17</sup> National policy is determined by a central politician.<sup>18</sup> At time 1, the central government sets levels of a public good,  $g$ , and transfers to each of the  $n$  regions,  $t_i \geq 0$ , subject to the budget constraint  $g + \sum_{i=1}^n t_i \leq \bar{R}$ , where  $\bar{R}$  is exogenously fixed, non-negative central revenues. At time 2, the governor of region  $i$  sets the levels of three types of public employment in his region:  $m_{ui}$  (“useful” employees—who produce public services),  $m_{pi}$  (“partisans and patronage recipients”, who increase the incumbent’s vote directly), and  $m_{ri}$  (partisans of his *rival*) given  $m_{ui}, m_{ri}, m_{pi} \geq 0$ .<sup>19</sup> He also allocates exogenously fixed, non-negative regional revenues,  $\bar{r}$ , and central transfers,  $t_i$ , to pay the wages of these employees. The level of wage arrears at the end of the round, expressed as a fraction of the total wage bill due, is determined as a residual:

$$a_i = \frac{w(m_{ui} + m_{ri} + m_{pi}) - \bar{r} - t_i}{w(m_{ui} + m_{ri} + m_{pi})},$$

where  $w$  is the exogenously fixed public sector wage,  $\bar{r} + t_i$  is the region's total revenues including transfers, all of which go toward wage payment, and  $w(m_{ui} + m_{ri} + m_{pi})$  is the region's total public sector wage bill.<sup>20</sup>

We assume that the regional governor's expected vote share,  $E(V_i)$ , increases with the number of "partisans and patrons" employed, but at a decreasing rate (the organizational efforts of the first dozen partisans are much more productive than those of the 100<sup>th</sup> dozen). The governor's vote share will also increase with the provision of public services, which will itself increase (at a decreasing rate) with the number of "useful" public employees. Third, the incumbent governor's vote share decreases by a fixed amount if a public sector strike breaks out in the region. The extent of the political cost to the governor will depend on whom voters blame for the strike. In many politically decentralized countries, the public views public sector strikes as in part a failure of the negotiation and crisis management skills of the *central* government, even if objectively the regional governments are more directly to blame. We therefore denote the loss in vote share to the governor of a region undergoing a strike  $S - \sigma_i$ , where  $S$  is a positive constant and  $\sigma_i$  is a constant (such that  $0 \leq \sigma_i < S$ ) which measures the propensity of voters in region  $i$  to blame the central government rather than the regional government for public sector strikes in their region. We expect  $\sigma_i$  to vary across regions depending on cultural factors and the ability of the regional governor to rally the regional population against central politicians. In particular, in the Russian context,  $\sigma_i$  will likely be higher in ethnic republics, which are to some extent culturally distinct from the Russian majority, sometimes have histories of victimization, and whose leaders often have well-developed anti-Moscow rhetorical repertoires. The ethnic republics also tend to be culturally traditional, and to have electorates that are more easily "managed" by their often semi-authoritarian leaders. We also expect  $\sigma_i$  to be higher in regions whose governors are from factions or parties that are rivals to those of the central incumbents. Governors affiliated with

the Russian Communist party in the 1990s would likely have believed that they could divert most of the blame for local strikes onto the “intransigence” and “shock therapy” of Yeltsin and his allies at the center. They would probably have been right in thinking that their constituents would accept such a characterization. We assume that the probability of a public sector strike in a given region increases at an increasing rate with arrears up to the point at which a strike becomes certain, after which point additional arrears cannot increase the strike risk.<sup>21</sup> We assume that a marginal increase in arrears from zero to a very small number does not increase the strike risk.<sup>22</sup> Thus,

$$E(V_i) = h[m_{pi}] + \gamma[m_{ui}] - \pi[a_i](S - \sigma_i),$$

where  $h' > 0$ ,  $h'' < 0$ ;  $\gamma' > 0$ ,  $\gamma'' < 0$ ; and

$\pi'[0] = 0$ ;  $\pi' > 0$ ,  $\pi'' > 0$ , so long as  $a > 0$  and  $\pi < 1$ ;  $\pi' = 0$ ,  $\pi'' = 0$ , when  $\pi = 1$ .<sup>23</sup>

The central incumbent's expected share of the vote in the next election,  $E(V_c)$ , increases (at a decreasing rate) with provision of the national public good,  $g$ . If a public sector strike occurs in any given region, we assume that this reduces the central government's expected vote in the next nationwide election by a fixed amount,  $\frac{\sigma_i}{n}$ .

$$E(V_c) = f(g) - \sum_{i=1}^n \frac{\sigma_i}{n} \pi[a_i], \text{ where } f' > 0; f'' < 0.$$

Solving the model by backward induction, at time 2 each regional governor sets

$m_{ui}$ ,  $m_{pi}$ , and  $m_{ri}$  to maximize:

$$E(V_i) = h[m_{pi}] + \gamma[m_{ui}] - \pi[a_i](S - \sigma_i)$$

$$\left. \begin{aligned} \frac{\partial E(V_i)}{\partial m_{pi}} &= h' - \pi' \frac{\bar{r} + t_i}{w(m_{ui} + m_{pi} + m_{ri})^2} (S - \sigma_i) \\ \frac{\partial E(V_i)}{\partial m_{ui}} &= \gamma' - \pi' \frac{\bar{r} + t_i}{w(m_{ui} + m_{pi} + m_{ri})^2} (S - \sigma_i) \\ \frac{\partial E(V_i)}{\partial m_{ri}} &= -\pi' \frac{\bar{r} + t_i}{w(m_{ui} + m_{pi} + m_{ri})^2} (S - \sigma_i) \end{aligned} \right\} \quad (1)$$

At equilibrium,  $\frac{\partial E(V_i)}{\partial m_{ui}} = \frac{\partial E(V_i)}{\partial m_{pi}} = 0$ . As will be proved,  $\frac{\partial E(V_i^*)}{\partial m_{ri}} < \frac{\partial E(V_i^*)}{\partial m_{ui}} = \frac{\partial E(V_i^*)}{\partial m_{pi}}$ , and therefore  $m_{ri}^* = 0$ . Denote the solution to this  $m_{ri}^*(S, \sigma_i, \bar{r})$ ,  $m_{pi}^*(S, \sigma_i, \bar{r})$ ,  $m_{ui}^*(S, \sigma_i, \bar{r})$ , and  $a_i^* \equiv \frac{w(m_{ui}^* + m_{ri}^* + m_{pi}^*) - \bar{r} - t_i}{w(m_{ui}^* + m_{ri}^* + m_{pi}^*)}$ . 24

At time 1, the central government sets transfers to maximize:

$$E(V_c) = f(g) - \sum_{i=1}^n \frac{\sigma_i}{n} \pi[a_i^*], \text{ subject to } g + \sum_{i=1}^n t_i \leq \bar{R}.$$

Since the budget constraint is satisfied at equality, we can rewrite:

$$E(V_c) = f(\bar{R} - \sum_{i=1}^n t_i) - \sum_{i=1}^n \frac{\sigma_i}{n} \pi[a_i^*]$$

$$\frac{\partial E(V_c)}{\partial t_i} = -f' - \frac{\sigma_i}{n} \pi' \left( \frac{-(m_{ui}^* + m_{pi}^* + m_{ri}^*) + \left( \frac{\partial m_{ui}^*}{\partial t_i} + \frac{\partial m_{pi}^*}{\partial t_i} + \frac{\partial m_{ri}^*}{\partial t_i} \right) (\bar{r} + t_i)}{w(m_{ui}^* + m_{pi}^* + m_{ri}^*)^2} \right) = 0 \quad (2)$$

Denote the solution to this  $t_i^*(\bar{R}, \sigma_i)$  and  $g^*(\bar{R}, \sigma_i)$ . This solves the model. We are now ready to prove some propositions (proofs are in the appendix).

**Proposition 1:** A governor who is newly elected to office will fire the partisans of his predecessor, and appoint some of his own:  $m_{ri}^* = 0$ . Assuming that firing opponents is quicker than hiring supporters, this implies that the election of a new governor will lead to a drop in public employment, followed by a rise.

From here on, for ease of exposition, we suppress the distinction between  $m_{ui}$  and  $m_{pi}$ , combining the electoral benefits of both in a single function,  $\phi$ . We also normalize the public sector wage to 1, and rewrite the model:

$$E(V_i) = \phi[m] - \pi[a_i](S - \sigma_i) \quad \phi' > 0, \phi'' < 0$$

$$\frac{\partial E(V_i)}{\partial m} = \phi' - \pi' \frac{\bar{r} + t_i}{m^2} (S - \sigma_i) = 0 \quad (1)$$

$$\frac{\partial E(V_c)}{\partial t_i} = -f' - \frac{\sigma_i}{n} \pi' \left( \frac{-m^* + \left(\frac{\partial m^*}{\partial t_i}\right)(\bar{r} + t_i)}{m^{*2}} \right) = 0 \quad (2)$$

where  $m \equiv m_{pi} + m_{ui}$ , and we use the fact that  $m_{ri}^* = \frac{\partial m_{ri}^*}{\partial t_i} = 0$ .

(Exactly the same results could be derived without these simplifications.)

**Proposition 2:** Provided strikes carry sufficient political cost for the central government, regions that receive larger transfers at time 1 will have larger increases in public sector

employment at time 2:  $\frac{\partial m^*}{\partial t_i} > 0$ .

**Proposition 3:** If the central government provides larger transfers to fiscally poorer regions

( $\frac{\partial t_i^*}{\partial r} < 0$ ), central transfers will induce a larger increase in public employment than locally

generated revenues:  $\frac{\partial m^*}{\partial t_i} > \frac{\partial m^*}{\partial r}$ .

**Proposition 4:** So long as strikes are sufficiently costly to the central government, public employment will be higher for a given level of central transfers in regions where the political

cost of strikes to the governor is lower:  $\frac{\partial m^*}{\partial \sigma_i} \Big|_{t_i} > 0$ .

To summarize, the model assumes that subnational governments will expand public employment at the price of running up wage arrears if the associated increase in public services, patronage, and campaign support will help them get reelected. The central government will often bail out governments with large wage arrears in the hope of preempting

strikes.<sup>25</sup> When they receive such aid, however, regional governments will only reduce rather than eliminating arrears and will usually increase public employment still further. If the central government allocates transfers disproportionately to fiscally poor regions, such transfers will boost public employment more than equivalent increases in the region's own revenues. Given the level of central aid, we showed that governors who have greater confidence in their ability to divert blame for local strikes onto the central government will increase public employment relatively more. In the Russian context, we hypothesized that this would be true of Communist-affiliated governors during the Yeltsin presidency, as well as of the leaders of ethnic republics. Finally, newly elected governors will fire some of the political clients and surplus employees hired by their predecessor. If it takes longer to fill the vacancies than to create them, this will lead to a temporary drop in public employment when a new governor takes office. We turn now to examination of the Russian case.

### **III. The Russian Experience**

#### *A. Data and Definitions*

Any analysis of public employment must begin with some definitions. Unfortunately, no universal and generally accepted definition of what is called public employment exists.<sup>26</sup> A comprehensive recent World Bank study defines it as employment in central and non-central administration, public health and education.<sup>27</sup> In a similar vein, we use a measure that represents employment in education, health care and sport, social protection, culture, art, science, and public administration—all public service providing sectors that in Russia are overwhelmingly financed from government budgets.<sup>28</sup>

Several points about this definition deserve comment. First, as in various previous studies, we do not include the military in the total.<sup>29</sup> These figures are not available for Russia, but even if they were the processes that govern hiring and firing in the armed forces are likely to be different from those in the civilian public service sectors. (We do include regional and local police within the category “public administration”.) Second, we do not include employment in state or municipally owned enterprises. Because of privatization, the

number of these dropped dramatically during these years. Again, the process of post-communist privatization is quite distinct from the politics of staffing the administrative and public service bureaucracies. It is the latter that we study in this paper.

The data have weaknesses that need to be acknowledged. Although our theory relates primarily to increases in public employment at the regional level, in most sectors we have no way of separating employment in regional government establishments from that in organizations under federal subordination. The federal/regional division of fiscal responsibilities varied between subdivisions of the public sector and changed over time. Regional budgets went from financing 66 percent of consolidated budget education spending in 1992 to 86 percent in 1996. The regional share of spending on social protection grew in the same period from 28 to 69 percent; that on health and sport from 89 to 90 percent; and that on state administration from 60 to 69 percent.<sup>30</sup> The changing framework of fiscal federalism needs to be borne in mind in interpreting the results. When studying the regional pattern of public employment, we exclude employment in the science sector, which remained almost entirely federally funded throughout the 1990s, and focus on sectors that were predominantly regional. (We obviously include science in the figures for aggregate federal and regional public employment.)

Another possible problem is that our measure embraces sectors that are mostly public but may, however, include some private entities (in education, health care, culture, and possibly research and art). The private sector share in these sectors was small during this period.<sup>31</sup> Moscow and St Petersburg are exceptions, containing most of the country's privately run healthcare and education. These cities also contain most of the federal public employment financed directly from the federal budget (for instance, that in federal ministries, major universities, theaters, libraries, hospitals, and research centers.) We therefore control for the capital cities in our multivariate regressions. The public employment data were available for 1992 to 1998. They were collected by Goskomstat on the basis of mandatory reporting by all public organizations in these sectors, with some adjustment for small private units.

*B. Examining the Pattern*

Three stylized facts characterize the evolution of public employment in Russia in the 1990s. First, aggregate public employment levels remained quite stable in absolute terms—and some categories even expanded dramatically (see Table 1). The one major decline came in the almost entirely federal science sector, where employment dropped from 2.8 to 1.2 million between 1990 and 1999. The number employed in the education, culture and art sectors shrank slightly from 7.23 to 7.06 million during the same period. This drop was far less than the employment decrease in the non-public economy, and so the share of these sectors in total employment increased from 9.6 to 11.0 percent. The absolute number of teachers in state schools in Russia grew by 336 thousand (a rise of 23 percent!) between 1990 and 1998.<sup>32</sup> The number of academic teaching personnel in state establishments of higher education rose by 14 percent in the same eight years. In healthcare, sport and social protection, the number of employees went up (by an additional 258 thousand workers) and employment in public administration grew by 45 percent (an additional 890 thousand) between 1990 and 1999.<sup>33</sup> The net result was a slight drop from 16.2 to 15.6 million public sector workers, and a remarkable increase in the public sector share from 21.6 to 24.4 percent of the total.

In some regards, this relative stability is surprising. It stands in sharp contrast to the trend in the rest of the economy. Total registered employment dropped by 15 percent during the decade, as economic reforms reshaped the economic landscape, official GDP collapsed, and the underground economy expanded. Employment in the category “large and medium-sized enterprises and organizations,” which includes all public employment, fell by 27.5 percent. As privatization gathered speed and state revenues shrank, employment in state-owned enterprises and organizations fell even faster than that elsewhere, from more than four fifths of total employment in 1990 to little more than one third in 1999. Of course, it is politically difficult to downsize public employment, but given the high turnover in Russia’s economy natural attrition could easily have done the job.

[Table 1 About Here]

Observers had expected that public sector employment would fall too.<sup>34</sup> Some decline

was seen as appropriate because employment in the health and education sectors started out from a comparatively high base—teacher-student ratios and other indicators of public service provision were often *higher* than in industrial countries. (In the socialist economies, such ratios had a high ideological priority for central planners.) As of the mid-1990s, there were more doctors per thousand inhabitants in Russia than in the UK, Germany, France, the US, or Japan.<sup>35</sup> In 1991, there was one teacher for every 14.1 students in Russian schools. This compared to figures of 17.6 in Canada, 16.0 in Germany, 15.9 in the UK, and 15.7 in the US.<sup>36</sup> In most other Central and Eastern European transition countries, health and education have downsized.<sup>37</sup> At the same time, the severe contraction of Russian state revenues seemed to make sharp public employment cutbacks inevitable. In fact, however, staffing levels actually increased during the decade. In 1998, the ratio of teachers to school students, already high at the beginning of the decade, had risen to one teacher per 12.2 students. The number of doctors per inhabitant rose by about two percent between 1990 and 1997.<sup>38</sup> These increases occurred despite a sharp decline in investment in buildings and equipment in these sectors, which reduced the productivity of personnel.

Second, public employment in Russia has been decentralizing. The devolution of fiscal responsibilities in healthcare, education, and many other branches from federal to regional governments caused a corresponding reassignment of manpower from federal to regional agencies and a decentralization of control over hiring. In education, healthcare, local administration, and many other branches, authority over most hiring was explicitly transferred by a series of laws to the subnational governments. But even in branches where little apparent devolution of responsibilities took place—most notably public administration—the regional and local bureaucracies have grown, while the central bureaucracy shrank. Data on the number of officials in central branches of federal government executive bodies are available only from 1994. These show a fall in central federal government officials by 5,000 between September 1994 and December 1998. Officials in federal executive agencies based in the regions did increase during this period by

35,000. But the number of regional and local executive officials increased almost twice as fast, by 60,000.<sup>39</sup>

Before 1994, data are only available for public administration within the city of Moscow (i.e. including both federal government and Moscow city government). This category of workers fell in absolute terms from 183 thousand workers in 1992 to 135 thousand in 1994. It is extremely likely that this contains a drop in federal employees. Employment in public administration in regions other than Moscow grew by about 190 thousand workers between 1992 and 1994. As of 1999, there were more officials of the Moscow city government working in Moscow than there were officials of the federal government (20,163 including local government subdivisions, compared to 13,854)!<sup>40</sup>

A third observation is that public employment levels varied significantly across regions. As of 1998, public employment in Russia's regions ranged from 19.5 percent of total employment in Moscow City to 41 percent in Tyva and 40 percent in Ingushetia.<sup>41</sup> In Magadan, only one out of every 19 inhabitants was a public employee; in nearby Sakhalin the figure was more than one in four (see Table 2). Regions differed not just at a particular point in time but also in the rate and direction of change. Table 3 shows that the mean public employment share has been growing while the variation remains fairly large. (Per capita levels of public employment have jumped around, but the range in values increased.) Except for Moscow City, all regions increased their public employment share, but the size of the change varied, as Chart 1 illustrates.

[Tables 2 and 3 and Chart 1 About Here]

How do the high public employment regions differ from the low public employment ones? To get a preliminary sense of this, we examined the ten regions with the highest public employment shares as of 1998 and compared them to the 10 regions with the lowest public employment shares. Most of the regions with the largest share are ethnically-defined units with autonomous status. They are mostly poor and heavily subsidized but enjoy relatively more administrative power than regions lacking autonomous status. Chita and Kamchatka Oblasts round out the list. The lowest rates of public employment occur mostly among

heavily industrialized regions, along with the capital cities of Moscow and St Petersburg. To explore whether the pattern fits the predictions of our theory, we now turn to multivariate analysis.

### *C. Multivariate Analysis*

Why did public employment remain so stable in Russia during the 1990s, despite the collapse of most other parts of the economy and the determined efforts of successive governments to reduce budget deficits and shrink the state? Why did the public employment share grow faster in some regions than others? We explore here to what extent the observed evolution of public employment in Russia fits the predictions of the model sketched out in section 2.

Propositions 1-4 yield a number of expectations about the regional pattern of public employment growth. First, public employment should fall—or, at least, grow more slowly—in the year after a new governor is elected to office in a given region, as the new officeholder eliminates the most notable partisans and clients of his predecessor. Geddes, in work on reforms of state capacity in Latin America, makes a similar prediction.<sup>42</sup> This prediction requires the additional assumption that displacing the political appointments of a previous incumbent tends to take less time than hiring a set of one's own—an assumption that seems to us plausible. Second, larger fiscal transfers from the center should lead to higher public employment.<sup>43</sup> Third, provided there is some element of deliberate equalization in the transfer program (which there ostensibly was in Russia during these years) the impact of increases in transfers on public employment should be greater than that of increases in regional own revenues. Fourth, public employment should be higher, controlling for the level of transfers, in regions where the governor would be most confident of his ability to divert blame for any public sector strikes and wage arrears onto the federal government in Moscow. We argued that this should be true of regions in which the governor was affiliated with the Communist opposition to incumbent President Yeltsin, and in ethnic republics, whose governors often had locally credible bases on which to assert central mistreatment.

To test whether these hypotheses fit the data, we ran a series of regressions (see Table 4). We used a cross-section, time series design to exploit both the cross-sectional and intertemporal variation in the data. We calculate coefficients by OLS, but report “panel-corrected standard errors”, as recommended by Beck and Katz (1995), which are corrected for panel heteroskedasticity and contemporaneous correlation.<sup>44</sup> To reduce problems of autocorrelation, we included a lagged term of the dependent variable, as recommended by Beck and Katz (1996), who argue that this is preferable to using generalized least squares or other available techniques.<sup>45</sup> The results should therefore be interpreted as explaining change in public employment rather than its absolute level. We also included dummies for year in the regressions, to separate general trends from patterns associated with particular regions.

The dependent variables in these regressions were measures first of aggregate public employment in the region, and then of the subcategories employment in health, sport, and social protection; in education, culture and art; and in public administration.<sup>46</sup> The measure of employment most suited to our theory is the number of public employees per thousand regional residents. But we also show regressions for public employment as a share of total employment in the region. This makes it possible to examine not just whether public employment levels are high or low in absolute terms, but whether public employment is crowding out—or compensating for the lack of—private employment (i.e., if the public share is increasing).

In running regressions on regional data to test predictions of our model, it is important to control for possible alternative determinants of public employment. Besides simple regressions including just our hypothesized determinants and year dummies, we therefore show regressions that include a range of controls. Wagner’s law would suggest that demand for public services would be higher in more developed or urbanized regions. To control for this, we included measures of regional gross regional product per capita and the proportion of the population living in urban areas.<sup>47</sup> We included previous year unemployment, using the ILO definition and regional rates reported by Goskomstat, to control for the effect of economic shocks *à la* Rodrik. To control for ethnic division, as

suggested by the work of Alesina, Baqir and Easterly (fn.3), we included the percentage of the population in ethnic republics that was non-Russian as of the most recent (1989) census.

Employment in education, healthcare or social protection might, naturally enough, be higher in regions with larger young and old populations. We controlled for the shares of the population aged under 16 and over 55, again using Goskomstat data.<sup>48</sup> We include a dummy for the two “capital cities” of Moscow and St Petersburg, since these contained much of the federal share of public employment and most of the emerging private sector in education, healthcare, and culture. Part of the increase in regional public employment might represent the creation of infrastructure necessary for a law-governed market economy—tax offices, unemployment assistance offices, antimonopoly bureaus, agencies dealing with bankruptcy, and so forth. In an attempt to control for this, we include a measure of the share of non-state enterprises in retail trade turnover (a proxy for the extent of marketization in the region, and thus demand for market infrastructure and regulation). This should also control for the extent of private sector competition to attract public sector workers. We control for the region’s population. Since our main dependent variables measure employment *per capita*, these might change simply because of growth or decline in the population rather than hiring or firing of public employees. In addition, there may be economies of scale that permit larger regions to satisfy the same public needs with proportionately fewer employees, which would affect the regression for public employment share.

We used data from a variety of sources to construct indicators of our key explanatory variables. Data on regional own revenues and transfers and loans to the regions are from Ministry of Finance reports on budget execution, for 1992-96 presented in Freinkman, Treisman and Titov (fn.30), and for 1997 obtained directly from the Ministry of Finance. Both are expressed in thousand December 1991 rubles per capita, deflated with the regional CPI’s calculated by Goskomstat. Transfers were made under a number of headings. From 1994, part were made by the Federal Fund for Financial Support of the Regions, financed by federal tax revenues, and disbursed officially according to a formula that favored regions with relatively low revenues and a large deficit in a base year. In practice, allocations under this

fund were subject to some discretion by Ministry of Finance officials.<sup>49</sup> A second major channel was “mutual transfers”, an accounting category that did little more than ratify a variety of ad hoc federal disbursements. Subventions, used to provide deficit support to mostly poor regions before 1994, were gradually phased out afterwards. In addition to transfers, the federal budget provided loans to a variety of regions. In 1995, the mid-year of our period, federal transfers and loans came to about 2.2 percent of GDP, of which 1.25 percentage points were FFSR transfers, .7 were mutual settlements, .12 were subventions, and .05 were net budget loans. In the same year, federal transfers and loans covered 17.9 percent of expenditures in the median region.<sup>50</sup> The range was from 0 to 81 percent, not counting the war zone of Chechnya. In the regressions, we include both the lagged revenue or transfer variable and the one-year change to make it possible to capture effects of both recent changes and longer run trends.<sup>51</sup>

The data on gubernatorial elections in the regions and on the political affiliations of the governors were gathered from a number of sources.<sup>52</sup> In coding the latter variable, we considered a governor affiliated with the Communist opposition if he was elected with the help of the Communist Party of the Russian Federation (KPRF), or the broader opposition grouping the NPSR; if he was a member of the national leadership of the KPRF; or if he ran on the KPRF’s national electoral list in 1993 or 1995. The number of such Communist governors rose from 1 in 1992 (Viktor Stepanov of Karelia) to 22 in 1997.

[Table 4 About Here]

A number of results emerge. First, we can safely reject the null hypothesis that public employment levels today can be entirely explained by the institutional and policy legacies inherited from the Soviet era. There *is* evidence of considerable continuity. Coefficients on previous year employment in Table 4 range from .72 to .93. A regression of public employment per capita on just a one-year lag of the dependent variable explains 57 percent of the variance. But various other theoretically plausible factors are also significant and improve the fit of the regressions. Continuity was far from perfect. While in a handful of regions, the number of public employees per capita fell between 1992 and 1998 (in

Kalmykia, by as much as 56 percent), in the median region it increased by 8 percent, and in a couple it rose by more than 50 percent.

We found some support for each of our main hypotheses. Newly elected governors did appear to trim back the public sectors they inherited. In the first year after a new governor was elected, the number of public employees per 1000 residents was lower than in other years. The drop—of 1.95 employees per 1000 residents, in the controlled regression—would translate into a fall in public employment by about 2,500 employees in the median region. (The median region in 1998 had 134,000 public employees.) This also resulted in a drop in the share of public employees in total employment by about .3 percentage points in the year after a new governor was elected (the median share in 1998 was 24.3 percent). The evidence suggests this post-election cut in public employment levels generally contained cuts in all three of the categories studied separately, though the drop in education, culture and art employees was not significant. Thus, in Russia as in Latin America, greater turnover of leaders and political competition does seem to help reduce pressures for overstaffing.<sup>53</sup> Such effects, however, were too weak to make much difference to the overall upward trend.

Second, larger federal transfers and loans were associated with higher public employment levels. Both the one-year change and the longer term trend were significant, but the effect of increases in transfers in the given year was slightly larger than the effect of previous year transfers. An increase in federal transfers and loans of one thousand rubles per capita (at December 1991 prices) translated into an additional 5.6 employees per 1,000 regional residents. To make this concrete, the median region in 1994, Chita Oblast, received federal transfers and loans that year of 286.5 December 1991 rubles per capita. Had it received federal aid one standard deviation higher, it would have had an additional 6.8 public employees per 1,000 inhabitants—or, in Chita's case, about 8,200 more public employees.<sup>54</sup> Had it received as much federal aid as the most favored region, Chukotka, it would have had an additional 34 public employees per 1,000 inhabitants, or 42,000 additional employees. (For reference, in 1994 Chita had 133,000 public employees.) Higher federal transfers were associated with higher staffing levels in education, culture, art and public administration; but

there was no significant effect for healthcare. Higher transfers and loans also resulted in a higher public to private employment ratio.

As expected, the impact of an increase in transfers in a given year (coefficient of 5.59 in the controlled regression) was greater than the impact of an equal increase in own revenues (coefficient of 4.02, not significant). Regional governments tended to increase public employment slightly more in response to higher federal transfers than in response to increased own revenues. The longer term relationship did not show this pattern (coefficients of 3.64 and 4.50 respectively on previous year transfers and own revenues). If one takes Proposition 3 as being about intertemporal change—rather than cross-sectional differences—then focusing on the inter-year change is more appropriate in any case. Thus, increases in federal transfers tend to boost public employment in a given region more than increases in that region's own revenues.<sup>55</sup> But it is less clear that cross-sectional differences among regions in the level of transfers will have greater impact than cross-sectional differences in the level of own revenues.

To this point, we have neglected the question whether transfers are endogenous. We have suggested that larger increases in federal transfers and loans caused governors to increase public employment. But the reverse causal pathway is also possible. Higher levels of public employment might themselves call forth larger federal transfers, if central allocators wish to finance an existing level of employees. While our model's implications on this score are less clear, it is quite possible that causation runs both ways. We lacked a sufficiently long time sequence of data to run reliable Granger tests of causality. However, we did run panel regressions trying alternately to predict the public employment share with lagged transfers and loans, and transfers and loans with the lagged public employment share.<sup>56</sup> Lagged transfers and loans turn out to be a significant (at  $p < .06$ ) predictor of the public employment share, controlling for the lagged public employment share and year dummies. The lagged public employment share is not at all significant in predicting transfers and loans. When we ran similar regressions for the public employment level per capita, lagged transfers and loans was not by itself a significant predictor of public employment.<sup>57</sup> But lagged transfers and loans

were more significant at predicting public employment than lagged public employment per capita was in a regression to predict current transfers and loans.<sup>58</sup> Thus, what evidence there is suggests that stronger causality runs from federal aid to public employment than vice versa.

Finally, opposition governors did tend to have higher public employment. Governors affiliated with the Communist opposition had public employment levels in their regions about 1.7 employees per thousand residents higher—or 2,280 employees higher in the median region. (The difference in the public employment share, however, was not significant.) Communist governors had significantly more employees in public administration, about 890—or 3 percent—more in the median region. They may also have had higher staffing levels in education, culture, and art, but this was not significant. This supports our prediction that regions in which the governor was less afraid of provoking a public sector strike would have higher public employment levels. We did not find significant evidence, though, that republic status had the same effect. Although the coefficients on republic status are always positive, they were not significant in controlled regressions.

With a few exceptions, the controls were not significant. More developed regions may have had a slightly lower share of public employment, perhaps because of greater private sector opportunities. Unemployment may have led to slightly higher hiring in public administration. Somewhat reassuringly, public employment in education tended to fall less sharply in regions with a larger school-age population. Education, culture and art employment also fell less where a larger proportion of retirees lived, though surprisingly employment in healthcare and social protection was not higher in such regions. Moscow and St Petersburg had higher levels of health and education employment, perhaps reflecting as suggested a larger federal or private component. We did not find any evidence that public employment grew faster in regions with larger market sectors, responding to demand for regulatory bodies and business services. We did consistently find higher public employment in regions with smaller populations, possibly reflecting economies of scale in public service provision in more heavily populated and urbanized areas. In tiny, frontier regions like Chukotka, with just 83,000 inhabitants, the share of the population needed to provide basic

public services is apparently large (32 percent in Chukotka's case). Finally, a clear time trend was picked up by our year dummies, which showed public employment rising quite sharply in 1994-6, before dropping in 1997 (the excluded category). This might have had to do with the anticipated wave of regional elections in late 1996 and early 1997, but there are also other possible explanations.

To sum up, the evolution of public employment in Russia's regions in the 1990s fits several predictions of the model we sketched, in which regional governments boost public employment by hiring partisans and clients, and extract greater federal aid by running up wage arrears and thus exacerbating the risk of public sector strikes. Governors affiliated with the Communist opposition tended to drive up public employment levels faster in their regions. Newly elected governors cut some flesh from the bureaucracies they inherited, but then generally went on to increase public employment themselves. Most notably, greater federal transfers apparently stimulated larger increases in public employment; and the increase in staffing levels induced by an increase in a region's receipts of aid was greater than the increase induced by an increase in its own revenues.

While the evidence is consistent with our model, we should note that other interpretations are also possible. We focus throughout on the demand side for public employment—how many employees the political decisionmakers want to hire. But the market also has a supply side. That public employment has stayed so high in Russia also reflects the fact that workers have not chosen to leave at high rates, despite low and irregularly paid wages.<sup>59</sup> Those that did quit were easily and rapidly replaced. We doubt that the supply-side can explain interregional differences at this point: informal evidence does not suggest, for instance, that Moscow's public sector shrank because the mayor could not attract employees, or that other regional governors were constrained by a shortage of job applicants. (In our regressions, the controls for per capita gross regional product and for size of the non-state retail sector should proxy for cross-regional differences in private sector opportunities, if these were important.) However, as private sector opportunities increase this might cause public sector workers to respond to wage delays not by striking ("voice") but by quitting

(“exit”), undermining one of the main links in the fiscal game that we identify. Another alternative interpretation relates to the ideology of governors. We suggested Communist governors oversaw faster growth in public employment because they had greater faith that in the event of a strike they could divert blame onto the “shock therapy” and penny-pinching of the central government. Communist governors might also boost public employment because of a greater ideological commitment to a large public sector. In fact, the model could be easily adapted to accommodate this possibility. The essential point is that Communist governors are less concerned about strikes *relative* to other goals.

While the regression evidence is supportive, we have done little so far to establish that the mechanism linking transfers and governor political position to public employment levels is the fiscal brinkmanship of our model. It is to this that we now turn.

#### *D. Other Evidence*

Our argument assumes a particular mechanism by which pressures, associated with higher regional public employment levels, are brought to bear on the central government to provide greater transfers. Do these fit what is known of the fiscal political bargaining of Russia in the 1990s? We present here a number of additional pieces of evidence.

First, our theory provides a reason why regional governments would continue to hire additional employees despite a backlog of arrears on wages due to those already employed. Such behavior struck many contemporary observers as absurd and contradictory. From the perspective of our model, however, accumulating positive wage arrears is a rational and effective strategy to boost the governor’s electoral prospects and extract greater federal aid. As each period part of the wage bill goes unpaid, the stock of arrears should increase over time, at least up to some threshold.

This aptly describes Russia’s experience in the mid-1990s. First, public sector wage arrears grew dramatically. Overdue wages in healthcare grew from 823 billion rubles at the end of 1995 to 3,563 billion at the end of 1998 (though they dropped a little in 1997). Those in education grew from 1,398 billion to 5,582 billion.<sup>60</sup> Both of these rates were faster than

the average for the economy. Second, responsibility for wage arrears in education, health, social security, and culture and art lay almost entirely with the regional budgets. As of early 1999, the percentages of wage arrears due to underfinancing by the federal budget in these sectors were respectively 6, 1, 3, and 1.

Growth of regional wage arrears may have been due in part to underfunding of federal mandates, central regulation of public sector wage rates, or more generally to insufficient regional revenues. However, federal mandates were fairly uniform in their effect, and central regulations applied universally, yet the pattern of arrears growth varied dramatically across regions. It was not the fiscally poorest regions that accumulated public sector wage arrears the fastest. In fact, there is a weak *positive* correlation between a region's stock of wage arrears in health and education as a percent of the monthly wage bill at the end of 1997 and its total own revenues in 1996. Nor was it the regions that had the greatest demand for public services that accumulated the largest wage arrears. The size of the dependent population (aged under 16 or over 55) correlated *negatively* (at -.24) with wage arrears in education and health as a percent of the total wage bill.

Second, our theory assumes that greater public sector wage arrears in a region would have increased the likelihood of a public sector strike. The evidence supports this. By 1997, as Table 5 shows, strikes in Russia occurred almost entirely in the education sector.<sup>61</sup> In 1998, 95 percent of the organizations where strikes occurred were in education; and the education sector lost 66 percent of the total time lost to strikes (see Table 5). The extent of wage arrears in education in a given region as of the end of 1997 (as a percentage of the monthly wage bill) correlated at .39 with the number of man-days lost to strikes per thousand employees in the region that year. (Controlling for strike losses the previous year, per capita regional product, unemployment, or various other factor renders the relationship even stronger.)

[Table 5 About Here]

A third key assumption is that voters would blame the central government in part for strikes of regional public employees, even if objectively the regional governments were more to blame. Logically, this would make sense since at equilibrium the central government

would provide (different levels of) transfers to different regions to reduce wage arrears, and thus it could quite reasonably be blamed for providing inadequate transfers to some regions that later suffered a strike. At the same time, the salary rates for different types of public employees were mandated by federal regulations, and so the federal government did have a role in the determination of regional wages—and ultimately arrears too.<sup>62</sup> Empirically, the evidence that voters blamed the federal government for arrears and strikes in Russia is strong. Regions with higher wage arrears tended to have higher votes for the political opposition in the 1993 parliamentary election and lower votes for Yeltsin in the 1996 presidential election.<sup>63</sup> As of early 1996, a poll found that two thirds of those working in the healthcare and education sectors attributed their earnings situation to decisions taken at the federal level.<sup>64</sup> Not surprisingly, polls also found that public employees tended to distrust the federal government more than regional or local government bodies.

Did the federal government provide financial aid to regions with high wage arrears? Numerous examples of such emergency assistance packages exist. For instance, in February 2000, just before the scheduled presidential election, the governor of Omsk, Leonid Polezhaev, traveled to Moscow to negotiate for aid to pay striking teachers, whose action had left 40,000 school children in the region without classes. He reportedly met with the finance minister and acting president Vladimir Putin. On arriving back in Omsk, Polezhaev's deputy "assured the strikers that the money necessary for paying out the teachers' salaries should arrive in the oblast in the next 10 days."<sup>65</sup> On numerous occasions, central policymakers, visibly alarmed by growing wage arrears in education and health and by the strikes and demonstrations they provoked, mounted campaigns to reduce public sector wage arrears across the country. In late 1998, for instance, the Primakov government sent a discretionary 1.3 billion rubles to the regional governments to help pay off their wage arrears.<sup>66</sup>

Governors who received such aid reduced but did not eliminate public sector wage arrears, however. Our assumption that governors deliberately retained some level of wage arrears is shared by various observers in the press and government.<sup>67</sup> As the head of the government's social policy department, Yevgeny Gontmakher, told one newspaper: "For

some governors, it is to their benefit to maintain wage arrears, in order to ask for more funds from Moscow.”<sup>68</sup> In December 1998, the federal Finance Ministry published a list of regions it accused of “misusing federal monies allocated for wages”.<sup>69</sup> In early 2000, First Deputy Finance Minister Alexei Kudrin accused the governments of Dagestan, Tyva and Kemerovo of failing to eliminate 700 billion rubles worth of wage arrears, despite receiving more than 1 billion rubles in loans.<sup>70</sup> Regions that received larger transfers and loans in 1996 or 1997 did not have lower arrears in education and healthcare in 1997. In fact, the correlation was positive. (And the same was true controlling for other revenues of the regional governments that year.)

In sum, a variety of evidence supports the view that regional governors deliberately exploited wage arrears in the 1990s, approving public employment levels higher than they could afford to finance, and thus creating a risk of strikes that threatened to undermine political support for the central government. Central officials responded by providing financial aid to alleviate wage arrears. Such transfers, while reducing the backlog, did not eliminate arrears, and actually encouraged governors to boost public employment still further, in an extreme case of moral hazard. Those governors with the least to fear from public sector strikes and the strongest ideological attachment to public employment—in particular, those whose support hailed from the Communist opposition to Yeltsin, and who could convince their supporters to blame arrears and strikes on central indifference—pushed this game of brinkmanship the furthest. One temporary limit on the public sector expansion was created by electoral turnover, as newly elected regional governors started their term by trimming back the patronage appointments of their predecessors. But such cuts did not reverse the trend.

The result was a system always on the brink of crisis, in which public services remained overstaffed, underpaid, and underequipped, and budget constraints refused to harden. No single player in the game masterminded—or probably even understood—all the reasons for this outcome. Rather, each economic actor responded quite rationally to the dysfunctional incentives that faced him. For workers, taking poorly paid but laxly supervised and relatively secure public sector jobs was part of a survival strategy in the face of rising

unemployment. School and hospital administrators sought to expand in order to diversify their services and claim more funds, which were still partly allocated in proportion to the number of teachers, students, hospital beds or other capacity parameters. Regional and local governments sought to protect local jobs and wages, to build a political power base, to boost their bargaining power, and to squeeze greater funds from higher level budgets. Finally, central politicians lacked the political resources to reform the social sector or the rules of federal politics unilaterally, and saw greater electoral gain in continuing to appease regional politicians and populations with additional funds.

#### **IV. Conclusion**

Why some countries—and subnational regions—have so much higher rates of public employment than others remains a key puzzle for political economists. Variation is great both among countries and within them. Existing theories that focus on economic development, political redistribution, and social insurance may explain part of the variation. But they raise additional puzzles, do not fit all the evidence, and fail to account for some noted recent developments such as the disproportionate growth of public employment at subnational levels in countries across the globe.

We developed a theory that may help to explain aspects of this question. In countries with weak legal systems and somewhat decentralized political institutions, high public employment levels may result from a kind of political and fiscal interaction between subnational and central politicians. Subnational politicians deliberately set their employment levels beyond their fiscal capacity, prompting transfers from the central government, which fears the political cost to it if wage arrears mount and public sector strikes break out. Within countries where such fiscal games occur, regions with governors that push competition furthest will tend to record higher public employment levels than those whose leaders are more fiscally responsible.

From the perspective of this theory, Russia's at-first-sight puzzling experience with public employment and public sector wage arrears in the 1990s appears to follow a certain

logic. Despite a severe economic crisis that reduced private sector employment, a sharp drop in tax revenues, and a central government committed to shrinking the state, the aggregate public employment level remained quite stable, and employment in public administration mushroomed. Most of the increase appears to have occurred at the regional and local levels. Growth was greater in regions where a governor from the Communist opposition was in power. It was lower in the year after a new governor was elected—and apparently cut back the patronage appointments of his predecessor—but this only temporarily reversed the trend. Larger federal transfers led to larger increases in public employment, and increases in federal transfers drove up public employment by more than equal increases in the region's own revenues.

Regional governors exerted pressure by driving up wage arrears, particularly in the education sector, to the point at which a teachers' strike became likely. Although governors pleaded insufficient revenues, it was not the regions with the lowest revenues or the greatest demand for health and education services that ran up arrears the fastest. Governors who felt relatively less politically sensitive to a strike could push the situation closer to the brink, and pass a greater share of public sector wage costs onto Moscow. Central politicians responded to such ploys with bailouts because regional voters would, quite rationally, have punished them if they did not. More than a few regional governors flew to Moscow in the 1990s with dire tales of imminent strikes, and returned with promises of cash. When the cash arrived, it helped to reduce wage arrears. But it also prompted governors to make more patronage appointments, driving up arrears again.

Seen in this light, Russia's bloated, underpaid, and aggrieved public sector seems less the result of inertia from Soviet times, or central mismanagement, than the dysfunctional outgrowth of a perverse fiscal interaction between vote-seeking politicians in Moscow and the regions.<sup>71</sup> Between 1992 and 1998, the number of doctors per 10,000 inhabitants in Russia rose from 43 to 46.7, compared to 28 in the US and 16 in the UK.<sup>72</sup> Death rates from a variety of major diseases rocketed. The number of public administration employees per 10,000 residents grew from 90 to 190, yet the common perception is of ever less efficient government

services. Regional governments have declined to downsize staff in order to finance capital investment, apparently because machines and school books neither vote nor stage strikes that can be used to extract financial aid.

Many causes probably contributed to the growth of public sector wage arrears. But a little arithmetic suggests that they could have been eliminated quite easily had employment in healthcare, sport, social protection and public administration at the regional level not increased by about 1.3 million workers in 1992-98.<sup>73</sup> Total public sector wage arrears peaked in the third quarter of 1998 at 20.9 bn rubles.<sup>74</sup> Between 1992 and 1998, employment in health, sport, and social protection increased by 226,000 and that in public administration grew by an estimated 1,049,000. These additional workers, if paid at the average wage in those sectors, would have received in 1998 alone 19 billion rubles. Had employment in public administration and in healthcare remained at their 1992 levels, governments would have saved enough in 1998 alone to pay almost all existing public sector wage arrears.

Various institutions in more stable, developed countries check the kind of competition we model. If courts reliably enforce judgments against local governments that do not pay promised wages, the attraction of running up wage arrears dims. However, this may merely shift the focus of the game without changing its nature. If instead of delaying wages regional governments announce layoffs and wage reductions “because the central government will not provide transfers,” this may create political risks for central politicians in much the same way. (Our model could be easily adapted to this context.) Similar center-regional games exist on a number of other policy dimensions, including the pricing of energy and provision of federal transfers to finance local energy supplies. Cohesive, vertical party organizations may render local politicians more obedient to their national party leaders. Center-region conflict appears to have slackened a little in Russia since Putin’s attempt to reimpose vertical discipline on the country’s governors.<sup>75</sup>

Such restraining institutions are likely to be undeveloped in countries that have recently introduced—or reintroduced—democratic elections. Besides Russia, Argentina since its transition seems to present a similar picture.<sup>76</sup> Between 1989 and 1994, the administration

of Carlos Menem made a determined attempt to shrink the public sector. The number of national public employees fell from 874 thousand to 190 thousand.<sup>77</sup> However, public employment in the country's 24 provinces grew slightly from 1,094 thousand to 1,103 thousand. Federal transfers to the regions increased markedly, from \$7.3 billion (US) in 1990 to \$15.2 billion in 1995. The increase in coparticipation transfers (the largest category) in 1991-6 correlated positively with the provincial level of public sector employees per capita as of 1996.<sup>78</sup> Observers have seen in this deliberate overstaffing by poorer provinces a strategy to elicit central bailouts. According to Tomassi, Saiegh and Sanguinetti: "Provinces can extract extra resources from the federal government by being in financial difficulties".<sup>79</sup> Avoiding public sector strikes appears to have been a concern of the Peronist Menem administration, although he turned out to be skilled in the use of divide-and-conquer tactics in relations with the unions. In Brazil, states experienced a worsening fiscal situation in 1994-96 as the central government attempted to bring down inflation, and they accumulated arrears on wages and payments to suppliers. The federal government responded by extending 2.5 billion reais in emergency loans to the state governments, on condition that they promise to implement fiscal adjustment policies.<sup>80</sup> One line of credit was specifically to pay off wage and other arrears.

Causes of high public employment undoubtedly vary from country to country. In some, such as Mauritius, Botswana or Barbados, an expanding public sector may indeed be a government response to greater trade exposure and economic volatility.<sup>81</sup> Yet these countries do not seem typical of Latin America or Subsaharan Africa, regions where the recent increase in public employment has been particularly pronounced. In other countries, public employment growth may reflect greater demands for public services stimulated by economic development—although among the OECD countries, it is not so clear that public employment levels correlate with income,<sup>82</sup> and among non-OECD countries providing public services effectively rarely seems to be governments' main aim. In many countries, public employment probably does serve as a channel for patronage, although why patronage would be more widespread in some countries than others is not well understood. Whatever the role played by

these factors, to understand the forces determining public employment levels one needs to examine the nature of the fiscal game played between governments at different levels and the role public sector workers play in the self-interested schemes of central and local politicians.

### Appendix: Proofs of Propositions

#### PROOF OF PROPOSITION 1:

If  $\frac{\partial E(V_i)^*}{\partial m_{pi}} > \frac{\partial E(V_i)^*}{\partial m_{ri}}$ , then  $m_{ri}^* = 0$ , since if  $m_{ri}^* > 0$  it would be optimal for the

regional government to replace any unit of  $m_{ri}$  with one of  $m_{pi}$ .

$$\frac{\partial E(V_i)}{\partial m_{pi}} = h' - \pi' \frac{\bar{r} + t_i}{w(m_{ui} + m_{pi} + m_{ri})^2} (S - \sigma_i) > \frac{\partial E(V_i)}{\partial m_{ri}} = -\pi' \frac{\bar{r} + t_i}{w(m_{ui} + m_{pi} + m_{ri})^2} (S - \sigma_i),$$

since, by assumption,  $h' > 0$ . QED.

#### PROOF OF PROPOSITION 2:

Denote  $F \equiv \phi'[m] - \pi'[a_i] \frac{\bar{r} + t_i}{m^2} (S - \sigma_i) = 0$ .

Using implicit differentiation,  $\frac{\partial m^*}{\partial t_i} = -\frac{\partial F / \partial t_i}{\partial F / \partial m} = \frac{-(S - \sigma_i) \frac{1}{m^{*3}} (\pi''(\bar{r} + t_i) - \pi' m^*)}{2\phi'' - 2(S - \sigma_i) \frac{(\bar{r} + t_i)}{m^{*4}} (\pi''(\bar{r} + t_i) - 2\pi' m^*)}$

If  $\pi''(\bar{r} + t_i) - 2\pi' m^* > 0$ ,  $\frac{\partial m^*}{\partial t_i} > 0$ . This condition, which can be rewritten  $\frac{1}{1 - a^*} < \frac{\pi''[a^*]}{2\pi'[a^*]}$ ,

defines a threshold level of  $a^*$ , below which  $\frac{\partial m^*}{\partial t_i} > 0$ . (Note that this is a sufficient, not a

necessary, condition;  $\frac{\partial m^*}{\partial t_i}$  might be positive above this threshold  $a^*$  if

$2\phi'' > 2(S - \sigma_i) \frac{(\bar{r} + t_i)}{m^{*4}} (\pi''(\bar{r} + t_i) - 2\pi' m^*)$ .) Recall that (1') defines  $m^*$  (and indirectly

$a^*$ ) as a function of  $t_i$ . Thus, by setting  $t_i$ , the central government indirectly determines  $a^*$ .

Its task is to trade off higher  $g$  against higher  $a^*$ , as in (2'), which can be

rewritten:  $f' = -\frac{\sigma_i}{n} \pi' \frac{\partial a^*}{\partial t_i}$ . The right hand side measures the marginal impact of spending

on transfers; the left hand side, the marginal impact of the central public good. Higher  $\frac{\sigma_i}{n}$

increases the right hand side ( $\frac{\partial a^*}{\partial t_i}$  must be negative), which requires an increase in  $f'$  and a

corresponding decrease in  $g$ , increase in  $t_i$ , and decrease in  $a^*$ . Provided  $\frac{\sigma_i}{n}$  is sufficiently

high,  $a^*$  will fall below the threshold in the range where  $\frac{\partial m^*}{\partial t_i} > 0$ . QED.

### PROOF OF PROPOSITION 3:

Using implicit differentiation,  $\frac{\partial m^*}{\partial \bar{r}} = -\frac{\partial F / \partial \bar{r}}{\partial F / \partial m^*} =$

$$\left(1 + \frac{\partial t_i^*}{\partial \bar{r}}\right) \frac{-(S - \sigma_i) \frac{1}{m^{*3}} (\pi''(\bar{r} + t_i) - \pi' m^*)}{2\phi'' - 2(S - \sigma_i) \frac{(r + t_i)}{m^{*4}} (\pi''(\bar{r} + t_i) - 2\pi' m^*)} = \left(1 + \frac{\partial t_i^*}{\partial \bar{r}}\right) \frac{\partial m^*}{\partial t_i}.$$

Hence, if  $\frac{\partial t_i^*}{\partial \bar{r}} < 0$ ,  $\frac{\partial m^*}{\partial \bar{r}} < \frac{\partial m^*}{\partial t_i}$ . QED.

### PROOF OF PROPOSITION 4:

Using implicit differentiation,  $\frac{\partial m^*}{\partial \sigma_i} \Big|_{t_i} = -\frac{\partial F / \partial \sigma_i \Big|_{t_i}}{\partial F / \partial m^*} = \frac{-\pi' \frac{\bar{r} + t_i}{m^{*2}}}{2\phi'' - 2(S - \sigma_i) \frac{(r + t_i)}{m^{*3}} (\pi''(\bar{r} + t_i) - 2\pi' m^*)}$ .

So long as  $a^*$  falls below the threshold defined by  $\pi''(\bar{r} + t_i) - 2\pi' m^* > 0 \Leftrightarrow \frac{1}{1 - a^*} < \frac{\pi''[a^*]}{2\pi'[a^*]} > 0$ ,

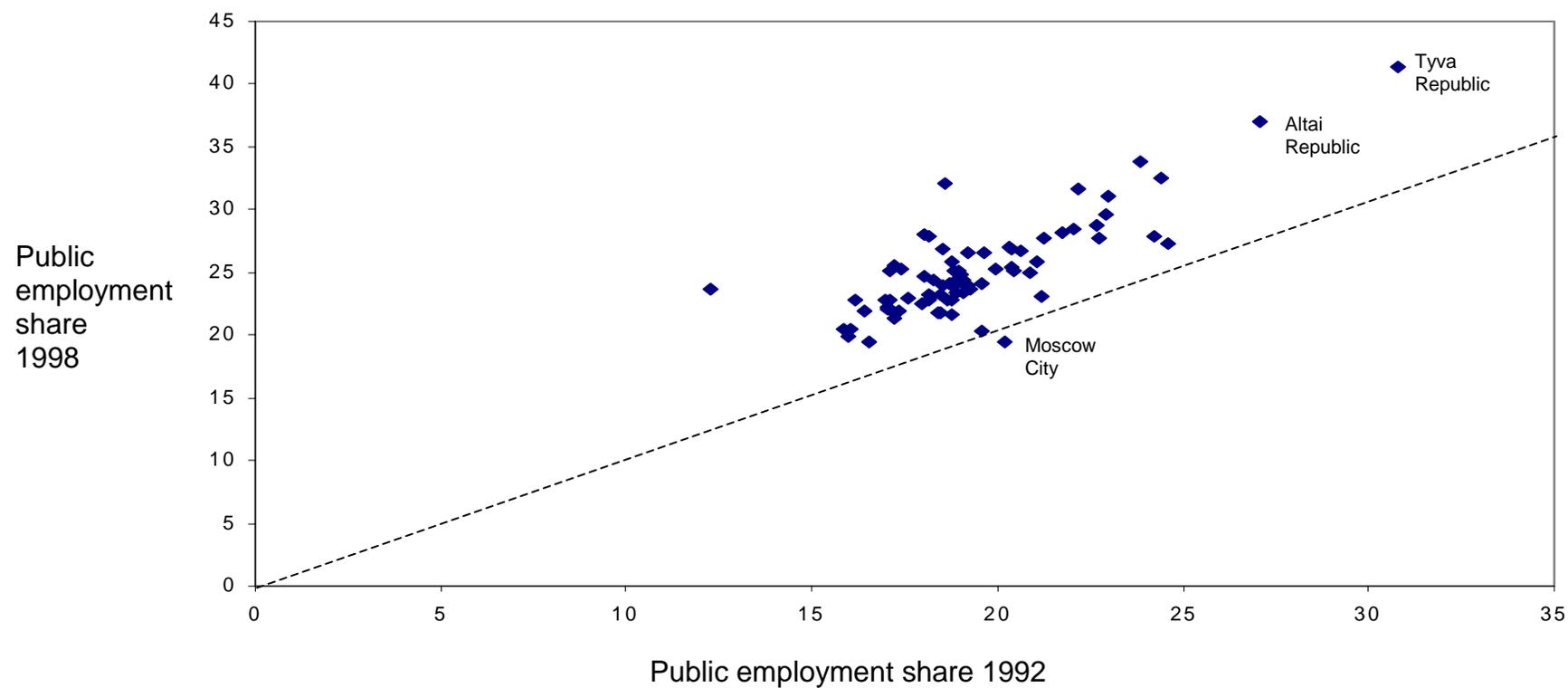
$\frac{\partial m^*}{\partial \sigma_i} \Big|_{t_i} > 0$ . QED.

## Tables and Charts

**Table 1. Employment in Selected Sectors with Predominantly Public Ownership**

	1990		1993		1994		1995		1996		1997		1998		1999	
	Thous- ands	% of total employ- ment														
1. Total employment	75,325	100	70,852	100	68,484	100	66,441	100	65,950	100	64,639	100	63,642	100	63,963	100
2. Health care, sport, and social protection	4,238	5.6	4,243	6.0	4,394	6.4	4,446	6.7	4,531	6.9	4,412	6.8	4,453	7.0	4,496	7.0
3. Education, culture, and art	7,231	9.6	7,239	10.2	7,383	10.8	7,316	11.0	7,313	11.1	7,144	11.2	7,033	11.2	7,064	11.0
4. Science	2,804	3.7	2,237	3.2	1,833	2.7	1,688	2.5	1,514	2.3	1,431	2.2	1,302	2.0	1,209	1.9
5. Public administration	1,968	2.1	1,874	2.1	1,898	2.2	2,259	2.9	2,655	4.0	2,581	4.0	2,777	4.4	2,858	4.5
Total lines 2 - 5	16,241	21.6	15,593	22.0	15,508	22.6	15,709	23.6	16,013	24.3	15,568	24.2	15,565	24.6	15,627	24.4

Source: Goskomstat Rossii, *Rossiisky Statistichesky Yezhegodnik 2000*, p.112; Goskmostat direct data transfer for 1999. We have adjusted the public administration figures to correct for a classification change; in 1996, 366 thousand fire fighters were reclassified from the housing utility sector into public administration. We have added 366 thousand to the public administration figures for 1992-5, on the assumption that the number of fire fighters did not change much in the preceding years. If the number actually increased, as in various other sectors, the totals underestimate the growth of public employment.

**Chart 1: Change in Public Employment Shares in Russia's Regions, 1992-98**

Source: Goskomstat Rossii; "public employment" = health, sport and social protection + education, culture, art, and public administration. The line represents no change in pe between 1992 and 1998; all regions located above the line have increases in pe.

**Table 2: Public Employees per Thousand Residents, 1998**

Sakhalin Oblast	267.35	Orel Oblast	97.95
Tyumen Oblast	241.52	Ryazan Oblast	97.81
Kamchatka Oblast	158.20	Yaroslavl Oblast	97.70
Tyva Republic	143.24	Penza Oblast	97.59
Sakha-Yakutia Republic	138.29	Novosibirsk Oblast	97.13
Chukotskiy A.O.	135.97	Tatarstan Republic	97.03
Altay Republic	133.94	Samara Oblast	96.60
Kalmykia Republic	124.97	Kemerovo Oblast	96.29
Archangelskaya Oblast	121.28	Kurgan Oblast	96.10
Tomsk Oblast	117.62	Tambov Oblast	96.04
Murmansk Oblast	117.26	Khakasia Republic	95.45
Moscow City	115.31	Kaluga Oblast	95.08
Komi Republic	114.05	Altay Krai	94.85
Chita Oblast	112.84	Bashkortostan Republic	94.78
Mordovia Republic	112.59	Smolensk Oblast	94.78
Karelia Republic	112.30	Chuvashia Republic	94.74
Primorskiy Krai	111.67	Ivanovo Oblast	94.70
Kostroma Oblast	110.93	Chelyabinsk Oblast	94.41
Khabarovskiy Krai	110.67	Lipetsk Oblast	94.00
Krasnoyarskiy Krai	110.56	Kursk Oblast	93.69
Evreyskaya A.O.	109.51	Nizhegorodskaya Oblast	93.33
Perm Oblast	109.44	Belgorod Oblast	93.04
Astrakhan Oblast	108.41	Bryansk Oblast	92.75
Udmurtia Republic	108.21	Adygeia Republic	92.60
St. Petersburg	106.98	Tver Oblast	91.76
Irkutsk Oblast	106.41	Kabardino-Balkaria Republic	91.68
Novgorod Oblast	105.59	Krasnodarsk Krai	91.66
Northern Ossetia Republic	105.01	Voronezh Oblast	89.71
Kaliningrad Oblast	104.89	Dagestan Republic	89.70
Mariy-El Republic	104.84	Vladimir Oblast	89.60
Pskov Oblast	104.07	Ulyanovsk Oblast	89.07
Kirov Oblast	102.95	Rostov Oblast	88.82
Omsk Oblast	101.54	Moscow Oblast	86.38
Orenburg Oblast	100.67	Tula Oblast	86.07
Vologda Oblast	100.46	Volgograd Oblast	85.80
Sverdlovsk Oblast	99.60	Karachaevo-Cherkessia Republic	85.13
Buryatia Republic	99.58	Leningrad Oblast	81.68
Amur Oblast	99.06	Stavropol Krai	81.00
Saratov Oblast	98.61	Magadan Oblast	51.61

Source: Goskomstat Rossii. Number is total workers in healthcare, sport, social protection, education, culture, art, and public administration (does not include science). Figures adjusted to include estimates for fire brigades.

**Table 3. Employment in Public Sectors, Descriptive Statistics, 1992-1998.**

<b>Public employment as a share of total employment (%)</b>	<b>N</b>	<b>Mean (un- weighted)</b>	<b>Standard Deviation</b>	<b>Minimum</b>	<b>Maximum</b>
<b>1992</b>	78	19.89	2.73	12.74	31.34
<b>1993</b>	78	20.28	2.93	14.35	34.07
<b>1994</b>	78	21.91	2.98	15.86	34.37
<b>1995</b>	78	23.39	3.16	17.30	35.23
<b>1996</b>	78	24.48	3.50	17.40	40.92
<b>1997</b>	78	24.18	3.56	18.46	40.02
<b>1998</b>	78	25.12	3.82	19.49	41.40
<b>Public employees per thousand residents</b>					
<b>1992</b>	78	96.17	16.50	64.33	198.27
<b>1993</b>	78	95.26	16.72	68.99	197.17
<b>1994</b>	78	98.44	18.96	72.42	209.54
<b>1995</b>	78	101.68	20.47	79.65	217.63
<b>1996</b>	78	104.29	15.08	83.90	159.24
<b>1997</b>	78	100.11	13.19	80.19	148.62
<b>1998</b>	78	105.83	28.69	51.61	267.35

**Table 4. What Explains the Regional Pattern of Public Employment?**  
(OLS with panel-corrected standard errors)

	<i>Dependent Variable</i>						
	Public employees <sup>1,3</sup> per 1000 inhabitants		Public employment <sup>1</sup> share of total employment (%)		Employees in health, sport, social protection per 1,000 inhabitants	Employees in education, culture and art per 1000 inhabitants	Employees in public admin- istration per 1000 inhabitants
	(1)	(2)	(1)	(2)			
<b>Previous year federal transfers and loans<sup>2</sup></b>	4.44** (1.96)	3.64** (1.79)	.71*** (.26)	.63** (.26)	.50 (.49)	2.08 (1.33)	1.00*** (.22)
<b>Change in federal transfers and loans this year<sup>2</sup></b>	5.30* (3.09)	5.59* (3.20)	.63** (.30)	.73** (.30)	.57 (.91)	3.82* (2.13)	.93** (.45)
<b>Previous year own revenues<sup>2</sup></b>	1.95** (.83)	4.50 (3.11)	-.25** (.10)	.20 (.15)	-.12 (1.00)	2.64 (1.86)	.87 (.60)
<b>Change in own revenues this year<sup>2</sup></b>	3.36 (2.10)	4.02 (2.62)	-.40* (.24)	-.27 (.23)	.74 (.72)	2.88* (1.70)	-.16 (.61)
<b>New governor elected previous year</b>	-1.68** (.71)	-1.95** (.82)	-.28 (.17)	-.32** (.16)	-.98*** (.31)	-.98 (.63)	-.63*** (.23)
<b>(At least part of previous year) governor affiliated with Communists</b>	1.84* (1.05)	1.73* (.99)	.39** (.18)	.33 (.20)	.22 (.26)	1.03 (.74)	.70** (.27)
<b>Ethnic republic</b>	1.28 (1.34)	2.58 (2.50)	.30* (.18)	.19 (.31)	.35 (.62)	1.67 (1.40)	.22 (.70)
<b>Controls</b>							
Gross regional product per Capita		-.52 (1.67)		-.15** (.07)	.27 (.61)	-.12 (.96)	-.28 (.19)
Percent of population urban		.062 (.052)		.007 (.009)	.018 (.022)	.043 (.027)	.002 (.018)
Previous year unemployment		.094 (.16)		-.007 (.032)	.016 (.060)	-.036 (.095)	.081** (.040)
Percent of population under 16		.55* (.32)		.039 (.053)	-.008 (.091)	.69** (.30)	-.13 (.09)
Percent of population over 55		.11 (.24)		.003 (.022)	-.011 (.086)	.28** (.14)	-.18** (.07)
Capital city		6.00 (4.23)		-.17 (.40)	1.73** (.73)	3.94* (2.07)	.61 (1.15)
Non-state share of retail trade turnover		-.040 (.062)		.002 (.006)	-.020 (.015)	-.024 (.036)	.002 (.019)
Population		-1.38** (.63)		-.14*** (.04)	-.22* (.12)	-.77** (.35)	-.29* (.15)
Non-Russian share of population in republics		-.084 (.064)		-.002 (.007)	-.010 (.018)	-.042 (.034)	-.020 (.013)
Lagged dependent variable	.81*** (.11)	.78*** (.15)	.93*** (.05)	.91*** (.07)	.72*** (.17)	.77*** (.14)	.81*** (.10)
1993	1.02 (1.15)	-1.48 (2.38)	.44* (.24)	.18 (.49)	-1.10** (.52)	-2.28* (1.21)	1.53 (.99)
1994	5.06*** (1.37)	3.28* (1.89)	1.62*** (.24)	1.36*** (.39)	.49 (.39)	1.33 (.86)	1.02 (.68)
1995	7.49*** (1.29)	6.81*** (1.41)	1.60*** (.17)	1.46*** (.21)	.75** (.30)	2.10*** (.57)	3.42*** (.59)
1996	6.58*** (.38)	6.10*** (.44)	1.37*** (.06)	1.29*** (.08)	.25*** (.09)	.95*** (.22)	4.35*** (.29)
<b>Constant</b>	12.23 (11.45)	2.47 (16.97)	1.23 (1.25)	.72 (2.99)	9.08 (7.16)	-12.20 (7.86)	8.47 (6.74)
<b>N</b>	390	389	390	389	389	389	389
<b>R<sup>2</sup></b>	.8359	.8472	.9308	.9345	.6895	.8609	.8699

Panel-corrected standard errors in parentheses. \* p < .10, \*\* p < .05, \*\*\* p < .01.

Note: Data from 1993-98. 1998 data were unavailable for transfers and loans or for unemployment.

<sup>1</sup> healthcare, sport and social protection; education, culture, art; and public administration. <sup>2</sup> in thousand December 1991 rubles per capita; mean in 1997 was 332. <sup>3</sup> Mean in 1998 was 105.8, standard deviation: 28.7.

**Table 5. Strikes in Education and Healthcare**

	<b>Education</b>				<b>Healthcare</b>			
	organizations in which strikes took place	share of total (%)	thousand man-days lost to strikes	share of total (%)	organizations in which strikes took place	share of total (%)	thousand man-days lost to strikes	share of total (%)
1992	4929	79	1217.5	64	943	15	292.9	15
1993	0	0	0	0	1	0	.1	0
1994	279	54	165.0	22	0	0	0	0
1995	8555	97	611.7	45	5	0	2.3	0
1996	7396	89	1488.6	37	229	3	162.8	4
1997	15610	92	3504.8	58	712	4	372.4	6
1998	10586	95	1890.4	66	143	1	62.2	2

Source: *Trud i zanyatost v Rossii 1999*, p.224

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<sup>1</sup> S. Schiavo-Campo, G. de Tommaso, and A. Mukherjee, *An International Statistical Survey of Government Employment and Pay* (Washington, DC: World Bank, 1997).

<sup>2</sup> Alberto Alesina, Stephan Danninger, and Massimo Rostagno, “Redistribution Through Public Employment: The Case of Italy” (National Bureau of Economic Research, Working Paper 7387, 1999).

<sup>3</sup> Alberto Alesina, Reza Baqir and William Easterly, “Redistributive Public Employment” (National Bureau of Economic Research, Working Paper 6746, 1998), 10.

<sup>4</sup> Adolf Wagner. *Finanzwissenschaft*, 3d ed. (Leipzig, 1883), excerpted in Richard A. Musgrave and Alan T. Peacock, *Classics in the Theory of Public Finance* (London: MacMillan & Co., 1958).

<sup>5</sup> S. Schiavo-Campo, G. de Tommaso, and A. Mukherjee, *Government Employment and Pay. A Global and Regional Perspective* (Washington, DC: World Bank, 1997), viii, find a close and significant positive relationship between the government employment share and national income (see also Peter S. Heller and Alan A. Tait, *Government Employment and Pay: Some International Comparisons* (Washington, DC: IMF, 1984)). They do not observe a clear association between income and public employment among the OECD countries taken separately (in this small-n estimation of data for the early 1990s), but using a different dataset on public employment in 1963-83, Thomas Cusack, Ton Notermans, and Martin Rein, “Political-Economic Aspects of Public Employment,” *European Journal of Political Research* 17 (1989), do. A. Kraay and C. Van Rijckeghem, “Employment and Wages in the Public Sector – A Cross Country Study” (IMF Working Paper, Washington, DC: IMF, 1995) find that government employment increases with urbanization and education levels.

<sup>6</sup> Alesina, Baqir, and Easterly (fn.3).

<sup>7</sup> David Cameron, “The Expansion of the Public Economy: A Comparative Analysis,” *American Political Science Review* 72 (4, 1978).

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<sup>8</sup> Dani Rodrik, “What Drives Public Employment?” (National Bureau of Economic Research Working Paper 6141, August 1997).

<sup>9</sup> Much of the literature on the growth of the state has focused on increases in public spending. Many of the same issues arise in explaining growth of public employment, but some additional issues are unique to the latter and require separate consideration. In this paper, we focus in particular on ways that the strike potential and voting of public employees (and the regional populations they serve) affect the fiscal games played among central and subnational governments.

<sup>10</sup> Allan H. Meltzer and Scott F. Richard, “A Rational Theory of the Size of Government,” *Journal of Political Economy* 89 (1981).

<sup>11</sup> Sanchita Saxena, “Variations in Reform Among the Sub-National Units in Argentina and India,” (Manuscript, Department of Political Science, UCLA, 2001) reports average levels of public sector employment per 1,000 inhabitants for Argentina in 1996 of 27 for the five high income provinces, 49 for the 14 middle income provinces, and 74 for the five poorest provinces.

<sup>12</sup> Alesina, Baqir, and Easterly (fn.3).

<sup>13</sup> Schiavo-Campo, de Tommaso, and Mukherjee (fn.5).

<sup>14</sup> In Argentina, provincial governments in the 1990s “issued IOU’s in lieu of paying wages” (G. Schwartz and C. Liuksila, “Argentina,” in Theresa Ter-Minassian, ed., *Fiscal Federalism in Theory and Practice* (Washington: IMF, 1997); see also Sebastian Saiegh and Mariano Tommasi, “The Dark Side of Federalism,” (Manuscript, Department of Political Science, NYU, New York, 2001). International Monetary Fund, *Brazil: Selected Issues and Statistical Appendix* (Washington: IMF, 2001), 156, reports that Brazilian states accumulated payroll arrears in the 1990s.

<sup>15</sup> Public sector wage arrears also decrease the reservation wage in the economy and set a new social norm, which induces the private sector to follow suit. Ultimately, the practice of not paying the contracted wage may

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spread to the whole economy (J. Earle and K. Sabirianova, “Equilibrium Wage Arrears: A Theoretical and Empirical Analysis of Institutional Lock-In,” IZA DP No.196, (Bonn: IZA, 2000). All this increases the fiscal and political pressure on the central government.

<sup>16</sup> It would be more realistic to assume that they seek to maximize the probability of reelection, but the results are likely to be similar and assuming vote share maximization avoids considerable additional technical complexity.

<sup>17</sup> In Russia, many governors were initially appointed from 1991, but elections spread gradually to all regions by 1996-7. In all, there was an expectation from the start that leaders would soon need to undergo election.

<sup>18</sup> Of course, we abstract here from the often complicated institutional settings in which policy is made at both subnational and central levels. Elaborating the model in a richer institutional context is left for future work.

<sup>19</sup> Not surprisingly, the governor will fire all partisans of his rival and set  $m_{ri} = 0$ , as we prove below. From this, we derive the prediction of a temporary drop in public employment when the leadership turns over.

<sup>20</sup> In the model, the central government moves first. All that is required for this to be realistic is that regional governments are able to adjust their levels of employment after they know how large their central transfers will be. It seems to us a reasonable assumption that governments can at least adjust the public workforce upward—hiring new workers—relatively quickly. We believe it would be possible—and probably easier—to derive predictions similar to ours if the model were complicated to permit the central government to increase transfers after public employment levels are set (this would create an additional element of moral hazard that regional governments could exploit). However, incorporating this additional stage in the game would render the algebra far more complex while yielding essentially similar insights.

<sup>21</sup> We assume that workers have a threshold level of arrears at which they will be willing to strike, and most workers’ thresholds are clustered together, leading to an explosion of strike readiness as arrears get into some intermediate range. No one will go on strike over a one-hour or a one-day wage delay, almost no one will strike

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over a one-week delay, but as arrears get above two or three months, the number willing to strike increases rapidly. The increase in strike risk as arrears rise will also be faster above a certain point because of the spreading knowledge of workers that their own wage experience is not isolated or accidental.

<sup>22</sup> This implies that there will be some positive level of arrears.

<sup>23</sup> Square brackets denote the function operator; round brackets are for multiplication.

<sup>24</sup> We use asterisks to represent equilibrium values.

<sup>25</sup> Note that our theory does *not* imply that regional governors actually want strikes to break out. On the contrary, they suffer a loss of utility in the event of strike equal to  $S - \sigma_i > 0$ . The point is that they deliberately create a risk of strike, knowing that this will elicit additional transfers from the center. Although they choose to gamble in this way, they would prefer to avoid an actual strike.

<sup>26</sup> See, e.g., Richard Rose, ed., *Public Employment in Western Nations* (New York: Cambridge University Press, 1985) and Schiavo-Campo, de Tommaso, and Mukherjee (fn.1).

<sup>27</sup> Schiavo-Campo, de Tommaso, and Mukherjee (fn.1), 47.

<sup>28</sup> “Social protection” includes organizations providing social assistance to the disabled, elderly, large families, orphans, etc. “Public administration” covers employees in government administration as well as various police forces (mostly regional and local police, traffic police) and firefighters.

<sup>29</sup> See, for example, Schiavo-Campo, de Tommaso, and Mukherjee (fn.5), Alesina, Baqir, and Easterly (fn.3).

<sup>30</sup> Figures for education, social protection, and health and sport are from Lev Freinkman, Daniel Treisman, and Stepan Titov, *Subnational Budgeting in Russia: Preempting a Potential Crisis* (Washington, DC: World Bank, 1999), Table A10. The 1992 figure for administration is calculated from figures in Sergei Sinelnikov, *Budzhjetny Krizis v Rossii: 1985-1995 g.*, (Moscow: Yevrasia, 1995), Table 5.1, which gives figures of 42

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billion and 64 billion rubles for state administration spending of federal and subnational budgets respectively. The 1996 figure is from Goskomstat Rossii, *Rossiisky statistichesky yezhegodnik 1999* (Moscow: Goskomstat Rossii, 1999), 492.

<sup>31</sup> As of 1997, only 0.8 percent of general education schools were in the non-state sector (more than a third of them in Moscow), and only 0.2 percent of all school students attended them (N. Glavatskaya, A. Moldavsky, and L. Lopatnikov, eds., *Reformirovanie Nekotorykh Otrasei Sotsialnoi Sphery Rossii* [Reform of Several Branches of the Russian Social Sector] (Moscow: IEPP, 1999), 150.)

<sup>32</sup> Goskomstat Rossii (fn.30), 187.

<sup>33</sup> We have adjusted Goskomstat figures to correct for a change in classification in 1996 of fire fighters as public administration employees. For lack of a better alternative, we increased the public administration figures for previous years by an amount equal to the fire fighter total as of 1996. If the number of fire fighters increased in 1992-95, as in other branches of public administration, our figure for employment growth will be an underestimate.

<sup>34</sup> A. Cheasty and J. Davis, "Fiscal Transition in Countries of the Former Soviet Union: An Interim Assessment," *MOCT-MOST*, 6 (1976).

<sup>35</sup> In Russia in 1996, there was one doctor for every 219 inhabitants (Goskomstat Rossii (fn.29), 588). In the UK the figure was 610 (in 1993), in Germany 286 (in 1998), in France 330 (in 1997), in the US 358 (in 1995) and in Japan 518 (in 1996) (figures from World Health Organization statistical database, ([www-nt.who.int/whosis/statistics](http://www.who.int/whosis/statistics))).

<sup>36</sup> Russian figure from Goskomstat Rossii, *Rossiisky Statistichesky Yezhegodnik 1998* (Moscow: Goskomstat Rossii, 1998); other countries, calculated from figures provided by UNESCO Institute for Statistics (<http://unesco-stat.unesco.org/>), Canada and US 1995, UK and Germany 1996.

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<sup>37</sup> A recent ILO study (M. Hammouya, *Statistics on Public Sector Employment: Methodology, Structures and Trends*, Working Paper No.144 (Geneva: ILO, 2000), 23) summarizing trends in public employment around the world concludes: "In general, where there has been a decrease in current total employment compared to the 1990 level, the decrease in public employment has been more marked; and where there has been an increase in total employment the increase in public sector employment has been less marked. It is the countries in transition which have registered the steepest declines in public sector employment". In Poland, the absolute levels remained stable, but against the background of an increase in total employment.

<sup>38</sup> Goskomstat Rossii (fn.36).

<sup>39</sup> Goskomstat Rossii, *Trud i zanyatost v Rossii 1999* (Moscow: Goskomstat Rossii, 1999), 96.

<sup>40</sup> *Ibid.*, .98. It is noteworthy that the one sub-sector of public employment that experienced a sharp drop during the 1990s, science, was the one that remained almost entirely federal.

<sup>41</sup> This represents the share of education, culture, art; health care and sport; social protection; and public administration in total employment. Ingushetia and Chechnya represent abnormal cases, since the ongoing hostilities may have resulted in a larger federal state presence. We do not include them in our regression analysis, in any case, because of lack of data from earlier years.

<sup>42</sup> Barbara Geddes, *Politicians Dilemma: Building State Capacity in Latin America*, (Berkeley: University of California Press, 1994).

<sup>43</sup> For more details on the rationales and practice of transfer programs, see Daniel Treisman, *After the Deluge: Regional Crises and Political Consolidation in Russia* (Ann Arbor: University of Michigan Press, 1999). One main channel of transfers was a Fund for the Financial Support of Regions, which was supposed to be aimed at aiding "needy" and "especially needy" regions. In practice, addressing social need appears to have become a more important motive in determining the Fund allocations as the decade progressed.

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<sup>44</sup> Panel-corrected standard errors are more accurate than standard errors computed by the Pools FGLS method for data of the kind analyzed in this paper (Nathaniel Beck and Jonathan N. Katz, “What to Do (and Not to Do) with Time-Series-Cross-Section Data,” *American Political Science Review* 89 (1995)). In STATA, we used the operation `xtpcse`.

<sup>45</sup> Nathaniel Beck and Jonathan N. Katz, “Nuisance vs. Substance: Specifying and Estimating Time-Series-Cross-Section Models,” *Political Analysis* 6 (1996).

<sup>46</sup> These groupings were necessitated by data availability.

<sup>47</sup> This should not be viewed as a test of Wagner’s Law *per se*, since the correlation between these two variables might reduce the estimated significance of each. And we also include regional revenues in the regressions, which should correlate with per capita GRP. The source of these data is Goskomstat. To minimize problems of endogeneity, we use data from as close to the beginning of the period as possible. The urbanization rate is for 1992. GRP was only available from 1994, so we use figures for that year.

<sup>48</sup> In including the age structure controls, we follow previous studies such as Alesina et al. (1998).

<sup>49</sup> Freinkman, Treisman and Titov (fn.30).

<sup>50</sup> Ibid. The median varied between 16 and 25 percent in the years 1992-97.

<sup>51</sup> Transfers and loans might be endogenous to public employment. We discuss this possibility below.

<sup>52</sup> These included Michael McFaul and Nikolai Petrov, eds., *Politicheskii Almanakh Rossii 1997* (Moscow: Moscow Carnegie Center, 1998); Michael McFaul, Nikolai Petrov, and Andrei Ryabov, *Rossia nakanune Dumskikh Vyborov 1999 goda*. (Moscow: Moscow Carnegie Center, 1999); Institute for East-West Studies, *Handbook of Regional Executives* (New York: IEWS, 1999).

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<sup>53</sup> Various anecdotal evidence supports the finding that newly elected governors are prone to cut public employment. In July 2001, the newly elected governor of Primorsky Krai, Sergey Darkin, announced a proposed reduction of 15-20 percent in regional administration personnel (*Rosbusinessconsulting* website, [www.rbc.ru](http://www.rbc.ru), accessed July 13, 2001).

<sup>54</sup> We treat the additional standard deviation in transfers as a one-year increase.

<sup>55</sup> Lev Freinkman and Michael Haney Freinkman, "What Affects the Propensity to Subsidize: Determinants of Budget Subsidies and Transfers Financed by the Russian Regional Governments in 1992-1995," Policy Research Working Paper 1818, (Washington, DC: World Bank, 1997) found that greater federal transfers were also associated with larger regional subsidies to inefficient enterprises and housing.

<sup>56</sup> The regressions were of the form: (1)  $pe_t = a + b_1pe_{t-1} + b_2trans_{t-1} + \mathbf{b}_3\mathbf{d}$ , and (2)  $trans_t = a + b_1pe_{t-1} + b_2trans_{t-1} + \mathbf{b}_3\mathbf{d}$ , where  $trans \equiv$  federal transfers and loans;  $\mathbf{d}$  is a vector of year dummies; and  $\mathbf{b}_3$  is a vector of coefficients on the year dummies.

<sup>57</sup> suggesting that current year changes are particularly important; these correlate negatively with lagged transfers and loans, which explains the insignificant result when the change variable is omitted.

<sup>58</sup> In fact, public employment was not only highly insignificant in a regression to explain transfers and loans, but its sign was negative.

<sup>59</sup> This may be due in part to the fact that little is often required of them, and they can work privately on the side while drawing a public salary.

<sup>60</sup> Goskomstat Rossii (fn. 39), 345.

<sup>61</sup> The healthcare sector also has a very high propensity for collective protest, which was partly neutralized by strong moral pressures on medical personnel not to strike and public outrage when fatalities could be linked to strikes. Nevertheless, cases of collective actions such as strikes or hunger strikes of unpaid doctors abound.

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<sup>62</sup> Vladimir Gimpelson, “Politics of Labor Market Adjustment. The Case of Russia”, in Janos Kornai, Stephan Haggard, and Robert Kaufman, *Reforming the State: Fiscal and Welfare Reform in Post-Socialist Countries* (New York: Cambridge University Press, 2001).

<sup>63</sup> Treisman (fn. 43), chapter 4.

<sup>64</sup> *Byuleten Obshchestvennogo Monitoringa*, No.2, (Moscow: VCIOM, 1996), 88.

<sup>65</sup> Institute for East-West Studies, *Russian Regional Report 5* (24 February, 2000).

<sup>66</sup> Glavatskaya, Moldavsky, and Lopatnikov (fn.31), 176.

<sup>67</sup> See, for example, *Ekspert*, “Uchitelya poterpyat,” 15 May, 2000, 14; *Segodnya*, March 13, 1997, reported on the massive misuse of such transfers.

<sup>68</sup> *Kommersant*, “You are talented, so find money!” 17 December, 1999.

<sup>69</sup> Radio Free Europe/Radio Liberty, *RFE/RL Newslines* 2 (No. 236 Part I, 9 December, 1998).

<sup>70</sup> *Rosbusinessconsulting* ([www.rbc.ru](http://www.rbc.ru)), accessed February 3, 2000.

<sup>71</sup> For another argument that many of the roots of current problems in Russia’s political economy lie in the poor state of center-region relations, see OECD, *Economic Surveys: Russian Federation*, (Paris: OECD, 2000).

<sup>72</sup> Goskomstat Rossii (fn.30), 213, 588, for Russian figures; US and UK figures are from World Health Organization (fn.35).

<sup>73</sup> This is based on the increase in employment in all regions other than Moscow.

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<sup>74</sup> *Russian Economic Trends* 8 (4, 1999), 109.

<sup>75</sup> If the central politician is confident that he has other stable bases of electoral support, he may be more willing to risk the consequences of regional strikes. If he has other leverage over governors, he may be able to use this to intimidate them into quiescence. On the other hand, the familiar fiscal games may well reemerge as a new election approaches or if the president's popularity slips significantly. Interlevel fiscal games are also likely to be less common in periods of economic growth, when private sector opportunities attract away public sector workers who are not well-rewarded. Such opportunities may, however, attract away skilled and diligent workers, while leaving patronage recipients in place, so the quality of public services may not improve with reductions in overstaffing.

<sup>76</sup> We are grateful to Robert Kaufman and Joan Nelson for attracting our attention to similarity between Russia and large Latin American countries in this regard.

<sup>77</sup> Saxena (fn. 11).

<sup>78</sup> *Ibid.*

<sup>79</sup> Mariano Tommasi, Sebastian Saiegh, and Pablo Sanguinetti, "Fiscal Federalism in Argentina: Policies, Politics, and Institutional Reform," *Economia* (Spring 2001).

<sup>80</sup> International Monetary Fund (fn.14), 156.

<sup>81</sup> Rodrik (fn.8).

<sup>82</sup> Schiavo-Campo, de Tommaso, and Mukherjee (fn.5).