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# Federal Tax Arrears: Liquidity Problems, Federal Subsidies, or Regional Protection?

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Three hypotheses about the nature of federal tax arrears in Russia in the second half of the '90s are tested empirically. Tax arrears can be a result of: 1) liquidity problems in firms, 2) federal implicit subsidies, or 3) regional political resistance to federal tax collectors. Liquidity problems do not explain federal tax arrears: higher arrears were found in more liquid and more productive firms. For a given level of liquidity and size, firms had higher tax arrears in regions with better bargaining position *vis-à-vis* center, i.e. better political strength (measured by higher popularity of governors, worse relationships with center, higher regional share in total tax collections and lower transfers) and higher economic strength (measured by higher expenditure provision and per capita gross regional product). In addition, excessive employment earned firms higher tax arrears. The results are consistent with active regional resistance and explain why federal tax arrears accumulated faster than regional arrears.

**Журавская Е.В., Пономарева М.В.** Неплатежи в федеральный бюджет: проблема ликвидности, федеральные субсидии или защита регионов от федеральных налоговых органов?/ Препринт № 2001/029.- М.: Российская экономическая школа, 2001.- 30с.(Англ.)

В статье эмпирически протестированы следующие три гипотезы о структуре налоговых неплатежей в федеральный бюджет России во второй половине 90-х годов: неплатежи являются результатом: 1) отсутствия ликвидности фирм, 2) неявных федеральных субсидий, 3) политической оппозиции региональных властей федеральной налоговой службе. Проблемы ликвидности фирм не объясняют федеральные налоговые неплатежи, т.к. самый высокий уровень неплатежей наблюдается у наиболее ликвидных фирм с большой производительностью труда. Среди фирм одинакового размера с одинаковым уровнем ликвидности самая большая задолженность в федеральный бюджет - в регионах с большей переговорной силой по отношению к центру, т.е., большей политической силой (измеряемой большей популярностью губернаторов, худшими отношениями с центром, более высокой долей налогов данного региона в федеральном бюджете и меньшими трансфертами). Кроме того, избыточная занятость также ведет к большей налоговой задолженности фирм перед центром. Полученные результаты подтверждают гипотезу о политической оппозиции региональных властей федеральной налоговой службе и объясняют, почему неплатежи в федеральный бюджет увеличиваются большими темпами, чем неплатежи в региональный бюджет.

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## 1. Introduction

During the recent years, tax arrears have played a significant role as indirect subsidies to firms in Russia. Figure 1 shows that stock of tax arrears to the consolidated budget went up steadily until the August 1998 crisis and, then, fell. Arrears to the federal budget accumulated almost with the same pace as the total stock of arrears before the crisis and stabilized after the crisis. Calculations support the visual impression: on average 60% of an increase in the arrears to the consolidated budget were driven by the increase in arrears to the federal budget; in contrast, only 40% of a drop in arrears to consolidated budget were driven by the decrease in the federal budget arrears. In common parlance, the federal tax arrears have grown faster and declined slower than the regional arrears. This paper aims at studying the nature of this phenomenon.

There have been several empirical studies of determinants of tax arrears in Russia. Using survey data on Russian enterprises, Alfandari and Schaffer (1996) found that in the early '90s financially distressed firms had considerably higher tax arrears compared to financially solvent firms. Schaffer (1996) argued that arrears propagate: increase in the inter-enterprise arrears leads to a significant increase in tax arrears and wage arrears.<sup>1</sup> These papers show that liquidity problems were important in determining the tax arrears in the first half of the '90s.

An explanation for a puzzle why the federal government is less successful in tax collection than regional governments recently was suggested in literature (Shleifer and Treisman, 2000; Treisman, 2000a, and 2000b; and Lambert-Mogiliansky, et. al., 2000). These works suggest that strong governors protect firms

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<sup>1</sup> In a later study, Schaffer (1998) confirmed that tax authorities did not force penalties on loss-making firms for not paying taxes and conjectured that tax arrears may arise as the result of firms' lobbying.

in their regions from the federal tax collectors through the capture of local branches of federal courts and tax collection agencies.

In the middle of 1996, presidential and regional governors' elections took place. These elections subsequently resulted in a shift towards much higher degree of regional independence from the federal center (Shleifer and Treisman, 2000).

Treisman (2000a), motivated by Shleifer and Treisman (2000), developed a model showing that accumulation of federal tax arrears in the second half of the '90s can be explained by the regional governors' protection of firms from the federal tax collectors. Using regional-level data, Treisman (2000b) puts this model to test. He finds some evidence that tax arrears were the result of political and fiscal interactions of the regional and federal authorities and does not find evidence that regional financial performance matters for tax arrears. The lack of data, however, precludes Treisman from drawing definite conclusions about the nature of these interactions. Treisman's study is most closely related to this paper. The advantage of our approach rests on availability of micro-level data. Firm-level data allows us to differentiate empirically between the alternative hypotheses at the regional and firm level: regional resistance, federal financing, and financial/liquidity problems in Russian firms.

This paper tests the three main hypotheses (which are not necessarily mutually exclusive): 1) federal tax arrears are caused by the lack of liquidity in Russian firms and political inability of the federal government to bankrupt them; 2) tax arrears are indirect federal subsidies to politically important firms; or 3) federal tax arrears result from regional political resistance to federal tax collectors.

We analyze enterprise-level data for 1996 and 1997. The main finding is that in 1997 regional governors protected regional enterprises from paying federal taxes: for a given level of liquidity and size, firms had higher tax arrears in regions

with better bargaining position *vis-à-vis* center, i.e. better political strength (measured by higher popularity of governors, worse relationships with center, higher regional share in total tax collections and lower transfers) and higher economic strength (measured by higher expenditure provision and per capita gross regional product). In addition, excessive employment earned firms higher tax arrears. Thus, recent federal tax arrears in Russia have emerged not as a consequence of the financial distress of enterprises, but as the result of a deal between the managers and local authorities on political protection of firms from federal tax collectors and general weakness of federal institutions.

The paper is organized as follows. Section 2 presents the testable hypotheses motivated by alternative theories of federal tax arrears. Section 3 describes the data and variables used in the empirical analysis. Section 4 contains the results. The conclusions are presented in Section 5.

## **2. Causes of Tax Arrears: Testable Hypotheses**

### **2.1. Lack of Liquidity (LL) Hypothesis**

Enterprises may accumulate tax arrears because they simply do not have liquidity to pay taxes. There could be several reasons for that: An enterprise could be profitable according to its books, but short of liquidity, because it is involved in a chain of inter-enterprise arrears; for instance, it experiences delays of payments for delivered products. Alternatively, an enterprise could be genuinely loss making and, thus, unable to finance its tax payments.<sup>2</sup> An enterprise management could also hide cash from the federal tax collectors; as a result we would observe low

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<sup>2</sup> A large share of taxes is independent of enterprise performance, i.e., payroll taxes.

liquidity in the firm that is an endogenous outcome of firm's resistance to paying taxes.<sup>3</sup>

The most direct measure of a firm's ability to pay taxes due, available to us, is the cash stock. If an enterprise is short of cash, it will not be able to pay taxes due. As indirect measures of liquidity problems we suggest gross trade credits given out by firms and being an electricity supplier. A firm, which issued large trade credits during the year, may not be able to meet its tax obligations because repayments are often delayed. If a firm is in electricity industry, it is also a likely sign of liquidity problems because the government does not allow electric suppliers to cut off many not-paying customers.

Thus, if one of the lack of liquidity stories is true, we expect to observe negative correlation between the federal tax arrears, on the one hand, and the cash stock of enterprises and the extent to which enterprises are involved in inter-enterprise arrears and trade credits, on the other. In addition, the electricity industry dummy should have an explanatory power for tax arrears.

The LL hypothesis does not, however, explain why the regional governors have been more successful in collection than the federal government.

## **2.2. Federal Financing (FF) vs. Regional Resistance (RR) Hypotheses**

Politicians at all levels of government are interested in maintaining high employment for political reasons; thus, they subsidize firms to finance inefficiently high employment (Shleifer and Vishny, 1994). Tax arrears are as effective way to subsidize firms as direct subsidies. Thus, for the same reasons, governments may choose to tolerate, delay, or write off tax arrears of large enterprises instead of

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<sup>3</sup> A firm management can tunnel liabilities (including tax liabilities) to a different firm that is specially organized for that. With available data it is impossible to differentiate between these specially created firms and real firms that have liquidity problems.

liquidating them or forcing them to pay. If governments are cash constrained or the law prohibits subsidies tax arrears may be more feasible for politicians than direct subsidies.

We consider the federal financing hypothesis. Under this hypothesis, the federal tax arrears arise as voluntary indirect subsidies from the federal authorities to politically important firms and firms with inefficiently high employment. The hypothesis predicts that large firms have higher tax arrears.

If the federal and regional governments had the same incentives to subsidize large firms by means of tax arrears independently of each other, there would likely be no difference in federal and regional tax collection. In contrast, the ability of regional governments to protect firms in their regions from paying federal taxes implies divergence in behavior of the federal and regional governments. This is the regional resistance hypothesis. It provides an explanation for the difference in tax collection trends because under regional resistance governors can subsidize firms without bearing direct financial (budgetary) costs of the subsidies with the exception of the cost of protection/resistance.

In exchange for regional protection, enterprises maintain inefficiently high employment (as in Shleifer and Vishny, 1994), pay bribes to the governors, or increase regional portion of their tax payments. The latter may happen because the federal and regional tax bases overlap. Treisman (2000a) suggests that regional authorities use protection from federal taxes to attract well-performing enterprises to their region by providing them with a better tax environment.

Our aim is to test the hypotheses of liquidity problems, regional resistance, and federal financing against each other.

There are several differences in incentives of the federal and regional governments that allow us to differentiate between the FF and RR hypotheses.

Since both the federal and regional authorities care about employment for political reasons, the size of an enterprise should be an important determinant of tax arrears for both stories.

We expect that for a given employment level, regional authorities would protect richer firms (firms with higher cash flows) since they are interested in leaving as much cash as possible within their region. In addition, regional governors would protect more liquid and profitable enterprises because they can extract higher rents from them in exchange for protection. Thus, regional protection implies positive correlation between cash stock and arrears. Under the federal financing and the lack of liquidity hypotheses we expect the reverse relationship to hold because, on the one hand, the federal government would be interested in high tax collection and, on the other hand, it would finance weaker firms because the political costs of liquidation/bankruptcy.

Controlling for firm-level characteristics, regional factors play an important role in federal financing and regional resistance theories. (Liquidity story implies no relation between most regional characteristics and firms' arrears.) The federal financing and regional resistance stories imply the opposite correlations between measures of political or economic regional strength and the federal tax arrears.

Governor's political popularity may influence the cost of regional protection. Popular governors are likely to have lower costs of protection because they can influence the policies of federal agencies located in the region more easily.<sup>4</sup> Thus, holding enterprise characteristics constant, the regional protection hypothesis predicts larger federal tax arrears in enterprises located in regions with broader

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<sup>4</sup> There is a potential endogeneity problem here and in several other places. The ability to protect regional enterprises may influence political ratings of governors as well. The sign of that influence is ambiguous. We try to avoid endogeneity problems in empirical analysis by taking lags of independent variables.



governor's political base. The federal financing hypothesis implies no relation between the political popularity of the governor and arrears.

Looking directly at bargaining strength of a governor and the federal center would be the best way to separating the hypotheses: The federal financing hypothesis predicts relatively large arrears in regions with governors who are loyal to the center and/or have weak bargaining position compared to governors who have tense relations with the center and strong bargaining position. This is because under federal financing hypothesis arrears are a voluntary federal subsidy. In contrast, the regional protection hypothesis predicts that loyal and/or weak governors should have firms with fewer arrears since they are less likely to resist the federal tax collectors. Unfortunately, bargaining strength is very hard to measure directly. We use two independently constructed indices that evaluate relationships of governors and the center. One was constructed by MFK renaissance and measures tensions of relationships of governors and the federal center; the Urban Institute constructed the other index measuring the power of regions in relations with the center. We discuss these variables in detail in the next section.

As a direct measure of capture (i.e. influence of regional authorities on the tax collection agencies), we look at the percentage of taxes that go to a regional budget out all taxes collected from that region. Regional protection hypothesis predicts positive correlation of this variable with the federal tax arrears. If this measure is positively correlated with arrears, it is likely that regional authorities have some power over distribution of collected taxes between the budgets.<sup>5</sup> The FF and LL hypotheses imply no correlation here.

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<sup>5</sup> According to the law, once some taxes are collected, they should be distributed between the budgets according to the preset rule. The dynamics of the tax arrears at the regional and federal level suggests that this rule is not implemented in practice.

The most direct way for the federal government to subsidize a region is by means of federal transfers. The direction of influence of this variable on tax arrears is ambiguous, however. Under the federal hypothesis, transfers and tax arrears may be complements or substitutes to each other. Under the regional hypothesis, correlation between federal transfers and tax arrears is negative. Regions that protect their firms from paying federal taxes should not depend on the federal transfers because the federal government can use transfers as a bargaining tool by cutting transfers if regions engage in capture of federal tax collectors.<sup>6</sup>

Richer regions probably have lower costs of engaging in capture of the federal tax collectors, for instance, because governors in these regions can offer better career opportunities to employees of regionally captured federal agencies in case they are fired by the federal center. In contrast, federal redistribution policies aim at smoothing the differences between the regions and, thus, the federal government would provide support to the relatively poor regions. The correlations of federal tax arrears with expenditure provision (percent of expenditures financed by own regional revenues) and gross regional product per capita allow differentiating between these two predictions. The RR hypothesis predicts positive correlation between these variables; the FF hypothesis implies negative correlation. (Lack of liquidity story implies no correlation, if one controls for firm's liquidity.)

Intensity of strikes in a region may reflect the scale of wage arrears problem and, thus, liquidity problems in firms.<sup>7</sup> In addition, strikes may be an instrument for enterprises or regional authorities to extract subsidies from the federal center.<sup>8</sup>

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<sup>6</sup> Treisman (1997) shows that distribution of federal transfers depends political bargaining of regions and the center.

<sup>7</sup> It is unlikely that enterprises, that do not have enough cash to pay their workers, are able to pay taxes. Schaffer (1996) shows that firms prefer running up tax arrears to having wage arrears.

<sup>8</sup> There is some anecdotal evidence that strikes are organized by the highly popular regional governors to put pressure on the federal government for subsidies and transfers.

Thus, all the hypotheses are consistent with positive correlation between tax arrears and the intensity of regional strikes.

Distance from the capital of the region to Moscow is an important control variable because it is harder for the federal government to collect taxes far away from Moscow. Costs of regional protection should depend on the ability of the federal government to control branches of its institutions in the regions. Thus, geographic distance to Moscow should be negatively related to the federal tax arrears according to regional protection story. Even without regional protection, however, the correlation of federal tax arrears and distance to Moscow should be positive because the federal government has limited resources for enforcement of tax collection and, thus, collects taxes where it is cheaper to do that.

We also control for military enterprises because they have special relations to the federal government that result in direct federal subsidies and tax breaks so that their tax arrears are likely to be small.

### **2.3. Official Delays of Due Taxes in Light of Our Hypotheses**

There was a sequence of several official tax delays that took place in 1994, 1996 and 1997.<sup>9</sup> Official delays may happen either as a result of federal policy or regional lobbying.

Data on distribution of delays across firms allows us to test the hypotheses further. We pose the question of which enterprises have been granted official tax delays for a given level of tax arrears. If tax arrears are the result of federal policy, official delays are even more likely to follow the deliberate federal policy pattern.

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<sup>9</sup> A time-series analysis of tax delays (Ivanova and Wyploz, 1998) found that official delays in tax payments caused tax arrears to go up. Ivanova and Wyploz provided evidence of strategic behavior of enterprises in accumulation of tax arrears: enterprises correctly predicted that the policy of granting delays was persistent over time and accumulated tax arrears in expectation of future delays.

In particular, the federal authorities should be more likely to forgive arrears in weaker regions. It would also be reasonable if the federal government grants the same delays for the same level of tax arrears. In contrast, regional bargaining is consistent with higher delays in stronger and richer regions, since these regions can bargain more effectively. Thus, regional bargaining implies that for a given level of arrears, delays are more likely in politically strong regions (i.e., regions with politically strong governors, tense relationships of the federal center and the governors, lower transfers, higher regional tax collections share) and economically strong regions (i.e., regions with higher expenditure provision and GRP per capita). The federal hypothesis implies either no correlation of delays for a given level of arrears with expenditure provision, GRP and tensions of relationships between the regional and federal authorities, or the opposite signs of correlations to the ones predicted by regional bargaining.

### **3. Data and Empirical Methodology**

#### **3.1. Data**

The tax arrears data came from the Russia's Tax Ministry (former State Tax Agency, STA). STA supplied us with a list of large enterprises and their values of the stock of federal tax arrears for the end of 1996 and 1997 and official federal tax delays at the end of the following quarters of respective years. We merged this list of companies to the Russian Enterprise Registry Longitudinal Data Base (RERLD), which contains statistical and financial data for large and medium-size Russian companies.<sup>10</sup> The resulted data set contained 1,374 firms in 1996 and 863 firms in 1997. We also used several financial variables from the firm balance sheets that we

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<sup>10</sup> Detailed information on how the RERLD was constructed is given in Brown and Brown (1999)

extracted from the Gnozis database. That reduced our sample to 861 firms in 1996 and 727 firms in 1997. In addition, we used several regional indicators from the GosKomStat (Official Russia's Statistical Agency), and two regional indices constructed by the Urban Institute and the MFK Renaissance.

The resulting sample consists of big industrial firms. For the distributions of firms in our sample across industries and regions see tables A1 and A2 in the appendix. Table A3 in appendix provides summary statistics on federal tax arrears and tax delays.

### **3.2. Variables and Empirical Methodology**

We ran a series of regressions to evaluate the evidence. The regressions took the following form:  $\text{Log}(\text{Stock of arrears}) = a_1 * (\text{Enterprise liquidity variables}) + a_2 * (\text{Enterprise importance variables}) + a_3 * (\text{Regional political and economic strength variables}) + a_4 * (\text{set of controls})$ .

Enterprise liquidity variables include  $\text{Log}(\text{cash stock})$  and  $\text{Log}(\text{outstanding credits per ruble of output})$ . These two variables were taken from the balance sheets of firms. Value of outstanding credit is our measure of firm's involvement in system of trade credits. Enterprise importance variables include  $\text{Log}(\text{employment per regional labor force})$  measuring how politically important are firms in their regions and  $\text{Log}(\text{value of output})$  measuring the firm size and  $\text{Log}(\text{labor productivity})$  measuring firm performance. Regional political strength variables include the percent of votes for the governor in the first tour of the last regional elections; MFK Renaissance Index of tensions of relationships between the governor and the federal center<sup>11</sup> (higher value means higher tension in relationships); Urban Institute Index of power of the regions in bargaining with the

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<sup>11</sup> XXX ADD DESCRIPTION OF HOW IT IS CONSTRUCTED

center<sup>12</sup> (higher value means stronger bargaining position of the region in relationships with the center); percent of transfers in total regional budgetary income; share of total tax collections that goes into the regional (as opposed to the federal) budget. Regional economic strength variables include expenditure provision (percent of budgetary expenditures covered by regional own budgetary revenues); Log (gross regional product per capita); Our controls include dummy for the electricity suppliers, dummy for the military sector, and the physical distance to Moscow from the region. In addition, we include percent of workers participating in strikes in the regional labor force as a regressor. The most important control for such a regression should be the amount of taxes due. The closest proxy for due taxes that we have is the size of the firm.<sup>13</sup>

Arrears data are available for January 1, 1997 and January 1, 1998. We run regressions for these two years independently. 1996 was the year of the presidential elections and 46 regional elections.<sup>14</sup> Both regional and federal election should have influenced on our results.<sup>15</sup> In particular, predictions about the regional incentives for capture should be weakened substantially by the presence of gubernatorial elections. Incentives for resistance to the federal center are small during elections because, first, the federal help in election campaigns can be very helpful for the governors. Second, since many governors were re-elected in 1996, it must take at least a year of newly elected governors' time to realize possibilities for capture and implement it. To control for that, in 1996 regression, we interact

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<sup>12</sup> XXX ADD DESCRIPTION OF HOW IT IS CONSTRUCTED

<sup>13</sup> Initially we tried to predict the federal tax obligations for the firms in our sample, by 1) estimating the equation of determinants of federal tax obligations for a smaller set of firms for which we have the tax obligations data, and 2) calculating the predicted tax obligations for the whole set of our firms with the fitted values. We, however, found that the size is the best predictor of taxes due and, thus, we dropped this two-stage procedure.

<sup>14</sup> Total number of regions is 89.

<sup>15</sup> We discuss the influence of federal elections on our results in the next section.

tensions of relationships between the governor and the federal center, bargaining power of the regions, transfers in budgetary income, and the regional share of tax collections with the dummy that equals one when there are no regional elections that year and zero otherwise.<sup>16</sup> All independent variables in each regression are lagged by one year to avoid endogeneity.<sup>17</sup>

In each regression, we use one of the regional economic strength variables along with votes for the governor and strikes in regional labor force and all other independent variables together. This is because these regional variables are highly correlated with each other and, essentially, measure the same thing: economic or political strength of the region.

Another set of regressions took the following form:  $\text{Log}(\text{delays}+1) = a_1 * (\text{arrears}) + a_2 * (\text{enterprise importance variables}) + a_3 * (\text{regional political and economic strength variables}) + a_3 * (\text{set of controls})$ .<sup>18</sup> We use the same enterprise importance and regional political and economic strength variables. A set of controls is also the same, except it does not include distance to Moscow because it should not influence the delays under any of the hypotheses. The independent variables are delays made on 01.04.97 and on 01.04.98. Just as before, we regress them

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<sup>16</sup> We run regression with both interaction term and the variable itself as well as with just the interaction term in order to check whether a correlation between the interaction term and the variable itself leads to multicollinearity. Both approaches lead to the same results.

<sup>17</sup> For instance, for the regression of arrears on January 1, 1997, enterprise output, employment and regional characteristics were taken for the year 1995; stocks of cash credits were taken for the beginning of 1996. Similar lags were used for Jan 1, 1998 arrears regression.

<sup>18</sup> The dependent variable is  $\text{Log}(\text{delays}+1)$  because delays can be equal to zero in our sample. Thus, to take logs we shifted our dependent variable. We also did Heckman estimation that simultaneously estimates the determinants of the probability that a firm receives a delay and given that it does, the determinants of the size of the delay. The most of variation in tax delays is in zero vs. positive delays, so that the probability part of Heckman estimation is more significant than the size part. So, the estimation of the probability of a firm getting subsidies yields similar results to the simple approach of estimating OLS with  $\text{Log}(\text{delays}+1)$  as dependent variable.

separately on the value of arrears on 01.01.97 and 01.01.98 (respectively) and other independent variables lagged by one year.<sup>19</sup>

Summary statistics for the variables used in regressions are in table A4 in appendix. Empirical predictions of our hypotheses in terms of our variables are presented in table 1.

#### **4. Results**

Regression results are presented in tables 2 and 3. Table 2 presents cross-section regressions of federal enterprise arrears on proxies for liquidity, size of enterprise and regional characteristics that measure political and economic strength of the region in which an enterprise is located.

Liquidity characteristics of firms matter for arrears. We find that holding everything else constant, tax arrears at the end of 1997 were significantly higher in firms, which had higher cash stock in the beginning of 1997. This contradicts both liquidity and federal financing hypotheses, since enterprises with higher cash stock are more able to pay taxes. This fact is, however, consistent with regional protection hypothesis since regional authorities would leave as much cash as possible within their region. In 1996, cash stock is insignificant.

Tax arrears in both years are strongly significantly positively correlated with given out credits (most of which are trade credits) relative to the value of firm's output (holding everything else constant). Although, this is consistent with the liquidity hypothesis, this result does not contradict the two other hypotheses because the managers can easily manipulate credits. It could be the case that the

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<sup>19</sup> We do not control for regional elections because they should be important for 1996 and delays that we have happened after 1996.



managers purposely engage in trade credit arrangements with other firms to avoid paying taxes. Thus, this evidence is consistent with firms' resistance to tax collection.

Arrears are higher in enterprises with larger employment in both years as both federal financing and regional protection hypotheses predict. In particular, higher employment per regional labor force leads to higher arrears for the same value of firm's output. Arrears are positively related to labor productivity, our best measure of firm's performance.<sup>20</sup> This is consistent with the regional resistance and also lack of liquidity hypothesis.<sup>21</sup> FF is inconsistent with this finding.

Regional characteristics of economic and political strength have the signs of correlation with tax arrears that are fully consistent only with the regional hypothesis. The correlations of all variables are especially strongly significant in 1997. In particular, in 1997 tax arrears are significantly higher in enterprises, which are located in the regions with higher tensions of relationships between the governor and the federal center (as measured by MFK Renaissance), higher bargaining power vis-à-vis center (as measured by Urban Institute), lower transfers in regional budgetary income, higher share of regional tax collections, higher expenditure provision, higher GRP per capita. These results show that federal tax arrears are larger in economically stronger regions in 1997. Interestingly, intensity of strikes in the region and votes for the governor (taken separately) in the last elections in 1997 have significant positive relation with tax arrears. Votes for the governor are insignificant if we control for the intensity of strikes, however. It turns out that these two variables are very highly multicollinear. Regions with larger

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<sup>20</sup> In table 2, to save space we report only one regression with labor productivity as an independent variable. We have, however, run all possible regressions with it to check robustness and concluded that this variable turns out to be very robust. It comes out positive and significant in all specifications.

<sup>21</sup> LL predicts that firms with tax arrears lack liquidity; this in principle can happen to very productive firms.

governor's political base had more strikes in 1997. This can be interpreted as regional governors that have high political support of the population can organize strikes that can strengthen their bargaining position against the center. Thus, we conclude that politically strong governors also led to higher federal arrears in 1997.

In 1996, popularity of governor, expenditure provision, and GRP per capita, and bargaining strength (interacted with no governor's elections) significantly affect federal tax arrears among regional characteristics. The signs of significant coefficients are consistent with the regional resistance hypothesis and inconsistent with both LL and FF. Votes for the governor are more strongly significant in 1996 compared to 1997 and they are not correlated with strikes. Electricity dummy and the distance to Moscow have significant positive effect on arrears in both years. Military dummy has negative effect in 1997.

Difference in the results between 1996 and 1997 is important. 1997 results are fully consistent with the regional resistance story and inconsistent with alternative explanations for tax arrears. 1996, however, looks a lot more like peaceful regional bargaining for tax arrears, since none of the variables that measure conflict between the federal center and the regions (tensions of relationships, transfers and regional tax collection share) do not matter in 1996. This can be explained by the fact that 1996 is the election year both at the regional and federal level. We try to control for the regional elections by looking at the interaction term between the conflict variables and dummy for no elections in 1996. This, however, effectively reduced our sample to by more than a half, which in turn may have reduced significance levels. The federal elections reduce the capture effect as well. Incentives of the federal center to be tough in tax collection enforcement efforts go down on election years. Thus, federal elections provide another explanation for weaker results in 1996. Finally, one can make an argument

that governors have realized the possibilities for capture only after the presidential elections in 1997, when Yeltsin became relatively weak.

On the whole, the results of federal arrears regressions in both years are fully consistent only with the regional resistance story and inconsistent with FF and LL.

Table 3 presents the results of tax delays regressions. In the first quarter of 1998, for a given level of arrears, firms were granted delays according to their size. The higher the number of employees in the firm (compared to the regional labor force), the higher the delays for a given value of the firm's output. The value of output itself influenced delays positively. Labor productivity is insignificant. As far as regional characteristics are concerned, votes for the governor are strongly positively significant, so are expenditure provision and share of regional tax collections. Regions with lower transfers in regional budgetary income got significantly lower tax delays. The stock of arrears influences tax delays in the first quarter of 1998 negatively. Both the signs of significant regional variables and of arrears are again consistent with the regional bargaining and inconsistent with federal financing. (The sign of correlation between the stock of arrears and delays should be positive under the federal financing story.)

In the first quarter of 1997, delays were not associated with the stock of arrears and employment. The output and labor productivity are significant, however. Both have positive correlation with delays. The delays, for a given level of arrears, were granted to firms in the regions with more tense relationships of the governor to the center, higher bargaining power, lower transfers and higher share of tax collections to regional budget. Electricity dummy is significantly negative. Therefore, in the beginning of 1997, resistance/bargaining regional variables and in the beginning of 1998 regional economic strength variables matter for federal tax

delays. These results are broadly consistent with the view that regional governors were helping firms to bargain for the delays.

## **5. Conclusion**

Our results have shown that tax arrears have been distributed across firms in a way that is inconsistent with the view that tax arrears result from the lack of liquidity in firms. We find that in 1997 tax arrears were greater in firms with higher cash. On the contrary, we find support for the Shleifer and Vishny's "politicians and firms" story. Tax arrears in 1996 and 1997 were higher in firms that had higher employment for a given level of output. Federal tax arrears were, however, not just an implicit subsidy from the federal government to firms with inefficiently high employment. Our evidence suggests that the federal government could not have collected these taxes even if it tried hard because the governors of relatively strong regions resisted to federal tax collection by capturing regional branches of federal tax collection agencies. In 1997, firms in economically and politically stronger regions (regions with better bargaining position) had significantly higher tax arrears controlling for their liquidity and size. We find that tax arrears were higher in regions with more popular governors, worse relationships with center, better bargaining power, lower transfers, higher regional share of tax collections, higher expenditure provision, higher gross product per capita. In 1996, results suggest that the peaceful bargaining solution was achieved. This is explained by the presence of regional and federal elections in 1996, which, on the one hand, decreased incentives of the federal government for being tough in tax collection and, on the other hand, decreased incentives of the governors to increase conflict with the center. In addition we find evidence that regional authorities helped the firms in their regions to bargain for the official federal tax delays.

The lesson out from this empirical exercise is that Russia's federal structure and, more precisely, weakness of the central government enforcement at the level of federation subjects was the fundamental reason for the accumulation of federal tax arrears. The regional resistance to the federal tax collection policies explains why federal tax arrears grew faster and fell slower than the regional tax arrears in the second half of 1990s. The reform of Russia's federalism seems to be the only way out.

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Figure 1

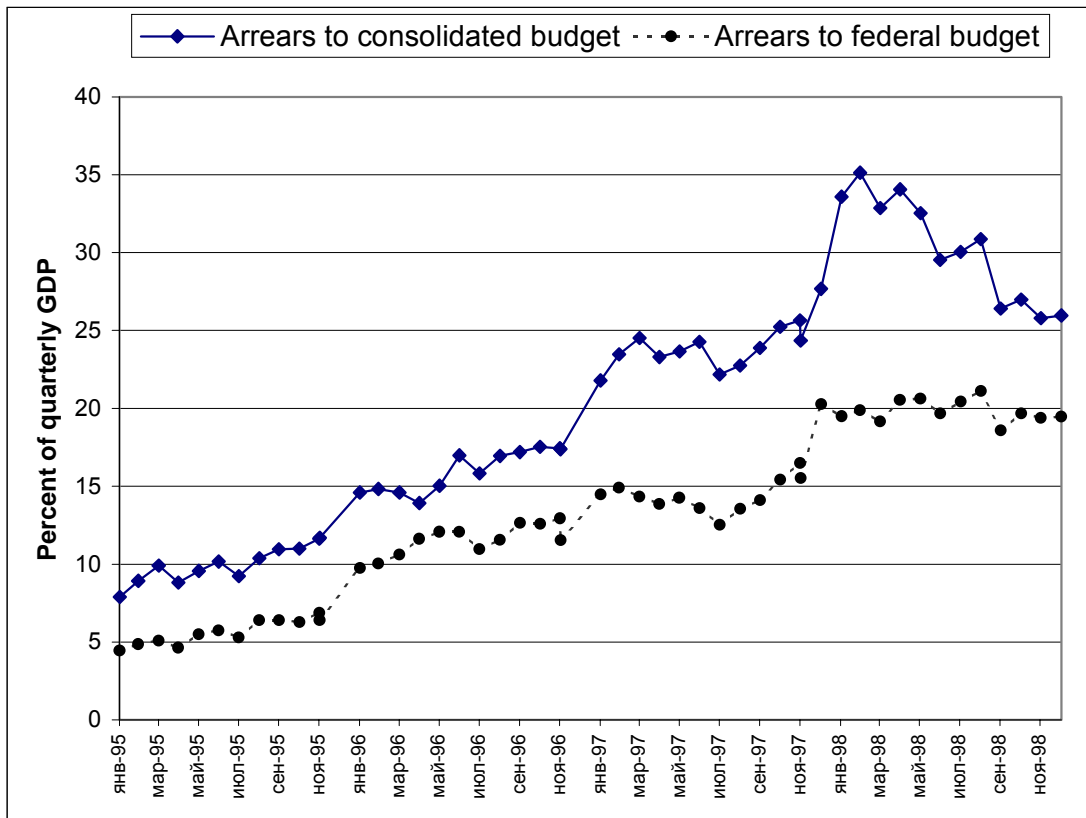


Table 1  
Empirical predictions of our hypotheses

	Log arrears in 1997			Log (Officially delayed taxes + 1)	
	Lack of Liquidity	Federal Financing	Regional Resistance	Federal Financing	Regional Bargaining
<b>Arrears:</b>					
Log arrears in 1997	_____	_____	_____	+	?
<b>Ent. Liquidity:</b>					
Log cash stock	-	-	+	_____	_____
Log credits per output	+	?	?	_____	_____
<b>Ent. Importance:</b>					
Log employment per regional labor	0	+	+	+	+
Log enterprise output	0	+	+	+	+
Log labor productivity	0	-	+	-	+
<b>Reg. Strength:</b>					
Votes for governor	0	0	+	0	+
Tension of relations to center	0	-	+	-	+
Power in relations with center	0	+?	+	+?	+
Transfers in total income	0	?	-	?	-
Share of tax collections to regional budget	0	0	+	0	+
Expenditure provision	0	-	+	-	+
Log GRP per capita	0	-	+	-	+
Strikes in regional labor	+?	+	+?	+	+?
<b>Controls:</b>					
Electricity dummy	+	+	+	?	?
Military dummy	-	-	-	+	+
Distance to Moscow	0	+	+	_____	_____



Table 2

	Log arrears in 1997								Log arrears in 1996							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
<b>Firm's Liquidity:</b>																
Log cash stock	0.05*** (0.01)	0.05*** (0.01)	0.03 (0.02)	0.03** (0.02)	0.03* (0.02)	0.03* (0.01)	0.04** (0.02)	0.06*** (0.01)	0.00 (0.02)	0.01 (0.01)	0.00 (0.02)	0.00 (0.02)	-0.01 (0.02)	0.00 (0.02)	0.01 (0.02)	0.03* (0.02)
Log credits per output	0.05*** (0.01)	0.05*** (0.01)	0.07*** (0.01)	0.07*** (0.01)	0.07*** (0.01)	0.07*** (0.01)	0.07*** (0.01)	0.06*** (0.01)	0.19*** (0.03)	0.19*** (0.02)	0.19*** (0.03)	0.19*** (0.04)	0.19*** (0.03)	0.17*** (0.03)	0.20*** (0.04)	0.18*** (0.04)
<b>Firm's Importance:</b>																
Log employment per regional labor force	0.17*** (0.04)	0.18*** (0.03)	0.20*** (0.05)	0.12** (0.05)	0.17*** (0.05)	0.16*** (0.05)	0.13*** (0.05)	0.31*** (0.05)	0.08 (0.05)	0.17*** (0.03)	0.08 (0.06)	0.08 (0.06)	0.13* (0.07)	0.12* (0.07)	0.05 (0.06)	0.31*** (0.07)
Log output	0.22*** (0.03)	0.23*** (0.03)	0.25*** (0.04)	0.29*** (0.04)	0.27*** (0.04)	0.27*** (0.05)	0.26*** (0.04)		0.34*** (0.04)	0.29*** (0.03)	0.34*** (0.05)	0.34*** (0.05)	0.32*** (0.05)	0.31*** (0.05)	0.34*** (0.05)	
Log labor productivity								0.19*** (0.04)								0.30*** (0.05)
<b>Reg. Pol. Strength:</b>																
Votes for governor	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.01*** (0.00)	0.00 (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)		0.01*** (0.00)
Strikes in regional labor force	0.09*** (0.01)	0.09*** (0.01)	0.08*** (0.02)	0.07*** (0.02)	0.07*** (0.02)	0.07*** (0.02)		0.06*** (0.02)	-0.05 (0.04)	-0.03 (0.03)	-0.05 (0.04)	-0.05 (0.04)	-0.05 (0.04)	-0.05 (0.04)	-0.06 (0.04)	-0.07* (0.04)
Tension of relations w/center	0.04* (0.02)								0.02 (0.03)							
Power in relations w/center		0.08** (0.04)								0.05* (0.03)						
Transfers in budg. income			-0.02*** (0.00)								0.00 (0.01)					
Share of regional tax collections				0.01** (0.01)				0.01* (0.01)				0.00 (0.00)				0.00 (0.00)
<b>Reg. Econ. Strength:</b>																
Expenditure provision					0.45*** (0.14)								0.36* (0.19)			
Log GRP per capita						0.34** (0.16)									0.45** (0.20)	
<b>Controls:</b>																
Electricity	1.17*** (0.13)	1.16*** (0.12)	1.09*** (0.15)	1.06*** (0.16)	1.07*** (0.15)	1.09*** (0.16)	1.03*** (0.16)	1.03*** (0.17)	0.09 (0.18)	0.50*** (0.12)	0.08 (0.24)	0.08 (0.24)	0.10 (0.24)	0.15 (0.24)	-0.05 (0.25)	0.07 (0.25)
Military	-0.30*** (0.10)	-0.29*** (0.10)	-0.30*** (0.11)	-0.24** (0.11)	-0.28*** (0.11)	-0.24** (0.11)	-0.28** (0.11)	-0.21* (0.11)	0.01 (0.15)	-0.13 (0.10)	0.01 (0.12)	0.01 (0.12)	-0.03 (0.12)	0.02 (0.12)	0.01 (0.12)	0.07 (0.12)
Distance to Moscow	0.06* (0.04)	0.06* (0.03)	0.02 (0.04)	0.02 (0.04)	0.06 (0.04)	-0.01 (0.05)	0.10** (0.04)	0.04 (0.04)	0.20*** (0.05)	0.15*** (0.03)	0.20*** (0.05)	0.20*** (0.05)	0.21*** (0.05)	0.14** (0.06)	0.21*** (0.05)	0.19*** (0.05)
Constant	4.45*** (0.44)	4.36*** (0.42)	4.91*** (0.71)	3.08*** (0.69)	3.43*** (0.66)	1.36 (1.27)	3.59*** (0.66)	5.38*** (0.54)	1.89*** (0.62)	2.54*** (0.40)	1.87** (0.78)	1.87** (0.79)	1.62** (0.82)	-1.24 (1.76)	2.20*** (0.75)	4.24*** (0.54)
Observations	857	857	857	857	857	857	857	857	721	721	721	721	721	721	728	721
R-squared			0.28	0.27	0.27	0.27	0.25	0.24	0.23		0.23	0.23	0.23	0.23	0.23	0.20

Robust standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Independent variables lagged one year

In 1996, "Tension of relations w/center", "Power in relations w/center", "Transfers in budg. income", "Share of regional tax collections" are interacted with "No regional elections in 1996".

Table 3

	Log (Taxes, officially delayed on Apr 1, 1998 + 1)							Log (Taxes, officially delayed on Apr 1, 1997 +1)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
<b>Arrears:</b>														
Log arrears on Jan 1 of resp. year	-0.57*** (0.08)	-0.57*** (0.08)	-0.60*** (0.08)	-0.58*** (0.08)	-0.59*** (0.08)	-0.58*** (0.08)	-0.55*** (0.08)	-0.13 (0.10)	-0.14 (0.10)	-0.12 (0.10)	-0.14 (0.10)	-0.12 (0.10)	-0.15 (0.10)	-0.11 (0.10)
<b>Ent. Importance:</b>														
Log employment per regional labor force	0.22*** (0.06)	0.23*** (0.06)	0.32*** (0.07)	0.21*** (0.06)	0.34*** (0.07)	0.25*** (0.06)	0.31*** (0.06)	-0.01 (0.10)	-0.03 (0.10)	0.06 (0.11)	-0.05 (0.10)	-0.10 (0.11)	-0.01 (0.11)	0.21** (0.10)
Log output	0.15*** (0.05)	0.14*** (0.05)	0.09* (0.05)	0.15*** (0.05)	0.09* (0.05)	0.13*** (0.05)		0.29*** (0.08)	0.33*** (0.08)	0.25*** (0.09)	0.35*** (0.08)	0.36*** (0.09)	0.31*** (0.08)	
Log labor productivity							0.05 (0.06)							0.33*** (0.09)
<b>Reg. Pol. Strength:</b>														
Votes for governor	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.00 (0.00)	0.00 (0.01)	0.01 (0.01)	0.00 (0.00)	0.00 (0.00)	0.00 (0.01)	0.01 (0.01)
Tension of relations w/center	-0.04 (0.05)							0.23*** (0.07)						
Power in relations w/center		0.01 (0.09)							0.27** (0.12)					
Transfers in budg. income			-0.02*** (0.01)							-0.03** (0.01)				
Share of regional tax collections				0.02** (0.01)			0.02** (0.01)				0.02*** (0.01)			0.02*** (0.01)
<b>Reg. Econ. Strength:</b>														
Expenditure provision					0.78*** (0.22)							-0.43 (0.42)		
Log GRP per capita						0.19 (0.18)							0.51 (0.33)	
<b>Controls:</b>														
Electricity	-0.06 (0.19)	-0.05 (0.19)	-0.02 (0.19)	-0.03 (0.19)	-0.05 (0.19)	-0.04 (0.19)	-0.06 (0.19)	-0.93*** (0.25)	-0.91*** (0.25)	-0.96*** (0.25)	-0.90*** (0.25)	-0.93*** (0.25)	-0.91*** (0.25)	-0.93*** (0.25)
Military	-0.01 (0.22)	-0.01 (0.22)	-0.10 (0.21)	0.02 (0.21)	-0.11 (0.22)	-0.01 (0.21)	0.01 (0.21)	0.23 (0.32)	0.27 (0.32)	0.18 (0.31)	0.33 (0.32)	0.33 (0.32)	0.27 (0.32)	0.43 (0.32)
Strikes in regional labor force	-0.01 (0.02)	-0.02 (0.03)	-0.01 (0.02)	-0.03 (0.03)	-0.01 (0.02)	-0.02 (0.02)	-0.05* (0.03)	0.08 (0.10)	0.10 (0.10)	0.16 (0.10)	0.10 (0.10)	0.11 (0.10)	0.10 (0.10)	0.06 (0.10)
Constant	3.47*** (0.85)	3.40*** (0.85)	4.58*** (0.94)	1.72 (1.10)	3.26*** (0.83)	1.86 (1.76)	3.20*** (0.99)	-2.24* (1.29)	-2.44* (1.30)	-0.99 (1.37)	-3.53*** (1.32)	-1.94 (1.32)	-6.36** (2.94)	-1.15 (1.00)
Observations	1374	1374	1374	1374	1374	1374	1374	863	863	863	863	863	863	863
R-squared	0.08	0.08	0.09	0.09	0.09	0.08	0.08	0.04	0.04	0.04	0.04	0.03	0.04	0.03

Robust standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Independent variables lagged one year

In 1996, “Tension of relations w/center”, “Power in relations w/center”, “Transfers in budg. income”, “Share of regional tax collections” are interacted with “No regional elections in 1996”.

## Appendix

Table A1  
Industry distribution of firms in our sample

Industry:	Number of firms in our sample, %	
	1997	1996
Energy, fuel extraction and refining	15.04	20.04
Metallurgy	4.48	6.43
Chemicals	4.40	6.13
Machine building	22.62	27.08
Wood cutting and processing	6.95	4.56
Construction materials	4.83	2.99
Light industry	3.53	3.66
Food industry	10.84	7.11
Jewelry	1.61	1.12
Agriculture	0.75	0.52
Transport	0.24	0.07
Installation and construction	15.4	13.24
Other	9.31	6.9

Vertically sums to 100%

Table A2  
Regional distribution of firms in our sample

Region	Number of firms in our sample, %		Region	Number of firms in our sample, %	
	1997	1996		1997	1996
Adygeya republic	0.08	0.15	Mordovia republic	0.38	0.44
Altai krai	1.14	1.32	Moscow city	5.74	3.29
Altai republic	0.04	0.07	Moscow oblast	2.85	1.61
Amur oblast	0.34	0.37	Murmansk oblast	0.80	1.10
Arkhangelsk oblast	1.79	1.54	Nizhny Novgorod oblast	2.36	3.80
Astrakhan oblast	0.19	0.15	North Osetiya republic	0.19	0.07
Bashkortostan republic	1.98	3.07	Novgorod oblast	0.15	0.07
Belgorod oblast	0.99	0.80	Novosibirsk oblast	1.67	1.46
Bryansk oblast	0.65	0.66	Omsk oblast	1.14	1.39
Buryat republic	0.53	0.37	Orenburg oblast	1.71	2.27
Chechnya republic	0.04	0.07	Oryol oblast	0.23	0.15
Chelyabinsk oblast	3.95	5.41	Penza oblast	0.80	0.95
Chita oblast	0.42	0.44	Perm oblast	3.12	2.41
Chukotka autonomous okrug	0.15	0.22	Primorskii krai	1.33	1.24
Chuvash republic	0.49	0.58	Pskov oblast	0.30	0.29
Dagestan republic	0.19	0.07	Rostov oblast	1.79	3.29
Evrei autonomous oblast	0.04	0.07	Ryazan oblast	0.87	1.02
Ingush republic	0.04	0	Sakha (Yakutia) republic	0.99	0.80
Irkutsk oblast	2.28	3.07	Sakhalin oblast	1.41	1.46
Ivanovo oblast	1.71	1.75	Samara oblast	2.09	2.85
Kabardino-Balkar republic	0.65	0.66	Saratov oblast	1.14	1.83
Kaliningrad oblast	0.30	0.37	Smolensk oblast	0.30	0.51
Kalmyk republic	0.04	0.07	St. Petersburg city	3.08	1.75
Kaluga oblast	0.61	0.44	Stavropol krai	1.10	0.73
Kamchatka oblast	0.53	0.58	Sverdlovsk oblast	4.22	0.80
Karachaevo-Cherkess republic	0.04	0.07	Tambov oblast	0.76	0.73
Karelia republic	0.76	0.95	Tatarstan republic	2.02	1.61
Kemerovo oblast	6.43	5.92	Tomsk oblast	0.76	0.73
Khabarovsk krai	1.41	1.24	Tula oblast	1.10	1.46
Khakasia republic	0.76	1.17	Tuva republic	0.04	0.07
Kirov oblast	1.18	1.68	Tver oblast	0.72	0.73
Komi republic	2.85	1.24	Tyumen oblast	5.36	4.17
Kostroma oblast	0.95	0.73	Udmurtia Republic	0.87	0.51
Krasnodar krai	1.33	1.32	Ulyanovsk oblast	1.03	1.61
Krasnoyarsk krai	2.43	2.92	Vladimir oblast	1.25	1.32
Kurgan oblast	0.42	0.58	Volgograd oblast	1.52	2.70
Kursk oblast	0.95	0.95	Vologda oblast	0.76	0.88
Leningrad oblast	0.61	0.51	Voronezh oblast	1.56	1.90
Lipetsk oblast	0.46	0.22	Yamalo-Nenets autonomous okr	0.04	0.07
Magadan oblast	0.87	1.46	Yaroslavl oblast	1.25	1.97
Mari-El republic	0.57	0.58			

Table A3  
 Summary statistics on arrears and delays

	1997	1996
<b>Federal tax arrears (billion rubles)</b>		
Observations	2,316	1,355
Median	6,173.5	6,955
Mean	19,940.1	31,884.2
Std. Deviation	82,672.3	140,043.5
Min	2	1
Max	2,830,869	2,805,409
<b>Delayed taxes (billion rubles)</b>		
Observations	2,316	1,355
Median	0	0
Mean	2,841.205	9,689.236
Std. Deviation	42,840.69	47,647.11
Min	0	0
Max	16,014,73	619,078

These include all firms for which we found registration number

Table A4  
 Summary statistics of variables used in regressions analysis:  
 (Still to do properly...)

Variable	Obs	Mean	Std. Dev.	Min	Max
larre97	2273	8.80	1.22	0.69	14.86
larre96	846	8.95	1.22	4.43	14.86
lde1497	868	1.14	2.98	0.00	12.41
lde1498	2273	0.59	2.19	0.00	11.81
lcash96	1697	11.28	3.19	0.00	22.37
lcash95	1716	11.75	2.94	0.00	22.55
credpo6	929	5.32	3.53	-5.71	14.99
credpo5	1159	2.86	1.90	-4.46	10.50
lempr196	1417	0.33	1.25	-4.71	4.18
lempr195	1440	0.34	1.26	-3.98	4.16
govvot1	1519	55.26	20.70	16.60	99.40
relcen98	1541	3.24	1.38	1.00	5.00
Powrwc97	1541	2.19	0.86	1.00	3.00
trans95	1541	13.94	11.28	0.20	64.40
trans96	1541	16.58	11.72	1.20	57.90
exppro95	1541	1.37	0.33	0.19	1.83
exppro96	1541	1.25	0.33	0.22	2.31
lgrppc95	1541	9.13	0.39	7.60	10.45
lgrppc96	1541	9.41	0.41	7.98	10.96
regtax95	1541	61.88	13.87	2.20	99.50
regtax96	1541	63.63	7.15	42.40	80.40
strike95	1525	0.01	0.01	0.00	0.07
strike96	1525	0.02	0.03	0.00	0.11
ind111	1561	0.06	0.25	0.00	1.00
military	1561	0.13	0.33	0.00	1.00
lout96	1425	12.42	1.59	5.45	19.18
lout95	1430	12.71	1.57	6.11	19.13
ldistmo	1481	7.22	1.00	5.12	9.38