

# **Tax Enforcement and Income Diversion: Evidence after Putin's election in 2000**

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## **Abstract**

Using a direct estimate of income diversion for a large sample of Russian firms from 1999 through 2004, we show that an increase in tax enforcement after Putin's election in 2000 is associated with a decrease in the appropriation of private rents by insiders both in firms explicitly targeted as tax evaders and among the largest firms in the sample. We interpret the latter as evidence consistent with a simultaneous spillover effect derived from the threat posed by tighter tax enforcement. This effect persists both economically and statistically in a subsample of listed companies after controlling for changes in firm-level corporate governance.

*Keywords: tax enforcement, income diversion, spillover*

*JEL Codes: D73, G38, H26*

*Declarations of interest: none*

## 1. Introduction

In this paper, we want to answer two questions. First, we investigate whether tax enforcement may be used as an instrument to curb income diversion by managers and/or controlling shareholders. Second, we analyze whether income diversion simultaneously decreases in other companies that are not explicitly being investigated for tax evasion and, if so, which firm characteristics are associated with this spillover effect.

To empirically answer these questions, we use a series of actions that started with a memorandum released by the Russian Ministry of Finance after the election of Vladimir Putin in 2000. The memo, issued in July 2000, states that “Sibneft, Slavneft, Yukos and TNKO show suspiciously low values of tax payments to the federal budget.”

Desai, Dyck, and Zingales (2007) document the case of Sibneft in detail. They show how Sibneft’s stock price reacted positive and significantly to the tax enforcement events. These excess returns are interpreted by the authors as market expectations of a decrease in income diversion by controlling shareholders and, consequently, higher returns for minority shareholders. Our first contribution is to document the actual decrease in income diversion in the case of Sibneft and the other companies explicitly cited in the memorandum, thereby providing empirical evidence consistent with the interpretation in Desai et al. (2007), namely, that tax enforcement curbs income diversion.

We follow a new approach introduced by Mironov (2013) to directly quantify a dollar-value estimate of income diversion. This method is based on the identification of special-purpose entities

called “spacemen:” short-lived firms created for diversion purposes through the artificial inflation of firm costs that are typically registered in the names of persons who have lost their IDs.<sup>1</sup>

Our sample comprises 60,401 Russian firms from over thirty different industries during the period of 1999-2004, with a total of 156,370 firm-year observations. The data show that income diversion is sizeable. The average company diverts 8.7% of its revenue per year from 1999 through 2004 (the median income diversion is 2.2% of revenue per year over the same period). Among the firms in the memorandum, income diversion drops from an average peak of 5.9% of revenues in 2001 to approximately 2% in 2003 and 2004.

Our second contribution is to provide evidence consistent with a spillover effect among the largest Russian companies. We show that, following the publication of the memorandum, the 1% largest companies by total assets in Russia decrease income diversion by approximately 300 basis points (b.p.) more than the rest companies in our sample. This result is robust after controlling for firm size, leverage, and firm and year fixed effects and is suggestive of a spillover effect of the tax enforcement measures that began in July 2000.

We hypothesize that larger firms reacted more promptly to the threat of tax enforcement after the memorandum was published in July 2000. We show that the largest companies were also the largest evaders. Given the limited resources of the tax authorities and the costs associated with the detection of tax evasion, we speculate that these companies immediately discounted that they would be the next target of Putin’s hardening on tax enforcement. Hence, they began to dismantle the evasion structure in place (i.e., spacemen) before the rest of the firms, leading to a sharper decline in income diversion.

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<sup>1</sup> Arguably, our approach to the measurement of diversion does not capture all the private benefits of control. For example, it does not capture diversion related to transfer pricing or the consumption of perks by executives. Our measures of cash flow diversion, therefore, may significantly underestimate the total private benefits that managers and/or controlling parties enjoy.

We present some facts consistent with this hypothesis and discuss alternative explanations. In particular, we consider the improvement of corporate governance among Russian firms (and, in particular, the largest firms) around the same time. We hand-collect data on several corporate governance variables for most of the listed companies in Russia, resulting in a sample of 153 firms and 681 firm-year observations from 1999 through 2004. Within this subsample, income diversion (scaled by revenue) decreased by 150 b.p. more among the top 10% largest firms by market capitalization starting in 2001. The average income diversion to revenues among the largest firms in 1999-2004 is 2.2% per year. There is no evidence that firm-level corporate governance affected income diversion in general or for large firms in particular. These results, however, should be interpreted with caution given the limited size of our sample and the endogeneity of firms' governance choices.

This paper contributes to the literature on corporate governance in Russia. Black (2001) finds a positive correlation between firm value and corporate governance for a reduced sample of 21 Russian firms in 1999. Black, Love, and Rachinsky (2006) then extend this evidence to a larger set of Russian firms and different governance indices for the period of 1999-2004. Overall, their results support a positive link between firm-specific corporate governance and value. We do not directly explore the link between governance and firm value. Our results, however, support the view of Desai et al. (2007) on tax enforcement as a governance mechanism in the hands of the government, the largest "minority shareholder" via tax collection.<sup>2</sup>

Beyond the Russian case, our results contribute to a broader debate on the efficacy of tax enforcement relative to corporate governance in tackling income diversion in emerging markets. A close

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<sup>2</sup> This view is shared by other recent papers. Bennedsen and Zeume (2015) document rent expropriation through tax heavens among a large set of publicly listed firms from 52 countries and find that increased transparency after the signing of Tax Information Exchange Agreements is associated with increases in shareholder value. Hanlon, Hoopes, and Shroff (2014) use the same event we use (the memorandum on tax evasion issued in July 2000) to show that "the change in tax enforcement led to an improvement in earnings informativeness."

reference to our work is Jiang, Lee, and Yue (2010), who document cash flow tunneling among Chinese companies through intercorporate loans during the period between 1996 and 2006. The authors conclude that only continued public enforcement was successful at eradicating tunneling. Although we cannot properly talk about a horserace between tax enforcement and corporate governance, our conclusions are similar for the Russian case. At least, we fail to find evidence of an interrelation between income diversion and firm-level corporate governance.

Additionally, we contribute to the literature on spillover effects in law enforcement. In this regard, Alm, Deskins, and McKee (2009) study tax compliance in a lab experiment and find that income reporting is sensitive to information obtained from other subjects. Rincke and Traxler (2011) present field evidence on externalities on compliance with TV license fees. In a paper more closely related to ours, Pomeranz (2015) finds strong evidence of spillover effects in VAT reporting among Chilean firms based on a randomized experiment. Methodologically, we follow a different approach. We use the election of Putin in 2000 as a quasi-natural experiment to show that the memorandum released by the Russian Ministry of Finance affected income diversion among the largest firms that were not explicitly mentioned in the memo.

The remainder of the paper is structured as follows. Section 2 presents the analytical framework of the paper and introduces our empirical strategy. Section 3 describes the data and the sample construction procedure. Section 4 presents our empirical results, which are interpreted and challenged in Section 5. We conclude the paper with Section 6.

## **2. Analytical Framework**

We borrow the model in Desai et al. (2007) to illustrate our tests. Let  $\theta \leq d \leq 1$  denote the proportion of income that insiders (controlling shareholders and/or managers) divert. Insiders own a fraction  $\lambda$  of the company. Diverting is costly, and this cost is represented by the quadratic function

$$C(d) = \frac{\gamma}{2}d^2,$$

where  $\gamma$  denotes the quality of corporate governance. There is also a tax system characterized by two variables: the corporate tax rate  $t$  and the level of tax enforcement  $\alpha$ . Increasing  $\alpha$  makes tax evasion more costly, as it can be interpreted as a higher likelihood of being caught and fined. Thus, the personal cost can be represented by the function

$$C(d) = \frac{\alpha}{2}d^2.$$

The total net payoff to the insider is given by

$$\lambda(1-d)(1-t) + d - \frac{\gamma+\alpha}{2}d^2.$$

Hence, the optimal amount of diversion is

$$d^* = \min\left(\frac{1-\lambda(1-t)}{\gamma+\alpha}, 1\right).$$

Given a tax rate  $t$ , this equation has the following implications:

1. Tighter tax enforcement reduces income diversion:  $\frac{\partial d}{\partial \alpha} < 0$ .
2. This effect is stronger when corporate governance is weaker:  $\frac{\partial d}{\partial \alpha \partial \gamma} > 0$ .

Our tests concern whether, as predicted by the model, an increase in tax enforcement is associated with lower income diversion and how this effect interacts with firm-level corporate governance. Although these implications are derived from the model, they are not explicitly tested in Desai et al. (2007). The direct measure of income diversion from Mironov (2013) allows us to test these predictions.

We use the series of actions implemented by the administration of newly elected President Vladimir Putin. His election in March 2000 was followed by a significant and largely unexpected change in the tax regime from that existing under his predecessor, President Boris Yeltsin. Desai et al. (2007) present a detailed chronology of these events, which we summarize in the Introduction.

One of the first actions was the dissemination of a memorandum released by the Russian Ministry of Finance on July 28, 2000, that identifies four large oil-extracting companies (Sibneft, Slavneft, Yukos and TNK) that were suspected of using tax evasion schemes. Desai et al. (2007) show that, subsequently, the pressure on Sibneft and other oil companies increased through the rest of 2000 until Summer 2001.

We investigate whether the new stance of Putin's administration on tax avoidance affected only the firms explicitly mentioned in the memorandum or, on the contrary, there was a spillover effect on other Russian firms across time. We hypothesize that if a spillover effect existed, larger firms should have responded more promptly and significantly to the new policy. This hypothesis is motivated by the limited resources of tax authorities and the high costs involved in the detection of fraud. Moreover, larger firms are likely to be the largest diverters in absolute terms.

Parallel to the increase in tax enforcement, companies in our sample exhibit, on average, an improvement in some corporate governance institutions. To rule out the possibility that a general trend in corporate governance is driving our results, we hand-collect a series of corporate governance variables at the firm level for virtually all publicly listed companies in Russia during our sample period. We use this subset of firms to further investigate the interaction between tax enforcement and corporate governance predicted by the model.

Before presenting our tests and results, we briefly describe the direct measure of income diversion in Mironov (2013). We then describe the data and the sample construction process.

## **2.1 Income Diversion Using Spacemen**

As an illustration of the method,<sup>3</sup> consider the following example. Firm A wants to divert \$X of income. Thus, it makes a deal with firm B whereby firm B renders to firm A goods or services worth

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<sup>3</sup> For a full description of the method, we refer the reader to Mironov (2013).

\$100 but for which firm A pays firm B  $\$100 + \$X$ . Firm B pays \$100 to a real supplier (firm C) that delivers goods or services, and firm B then returns  $\$X$  to firm A's manager or owner in the form of cash. This diversion hurts firm A's minority shareholders in two ways. First, mechanically, the company's EBITDA (earnings before interest, taxes, depreciation and amortization) decreases by  $\$X$ . Consequently, several of the company's performance and financial ratios, including its Interest Coverage Ratio, are negatively affected. Second, cash is removed from the company, which immediately reduces the market value of equity, jeopardizes the firm's ability to grow in the future, and thus directly affects the firm's market value.

Firm B is a fly-by-night firm called a "spaceman": it appears to come out of nowhere, does not perform any real activities, pays almost no taxes, and disappears ("flies into space") within 0.5 to 2 years. Because  $\$X$  can be large, spaceman schemes require the collaboration of bank officials. Mironov (2013) identifies 42,483 spacemen and estimates income diversion to be as large as 11.4%-13.1% of Russia's gross domestic product (GDP) during the period of 2003-2004.

Specifically, a firm is defined as a spaceman if it satisfies the following criteria: (a) the ratio of taxes paid to the difference in cash inflows and outflows (net tax rate) is less than 0.1%; (b) the firm pays less than \$7.2 in Social Security taxes per month, an amount that approximately corresponds to Social Security taxes paid on one minimum wage; and (c) the firm's cash inflows exceed its outflows. According to the Russian tax system, even a firm with a loss must pay VAT, Social Security taxes, and property taxes; hence, these criteria guarantee that such a firm cannot survive even a simple examination by tax authorities. Based on these criteria, we identify 99,925 spacemen for the period of 1999-2004.

This approach to the measurement of diversion does not capture all the private benefits of control. For example, it does not capture diversion related to transfer pricing, which Desai et al. (2007) document to be enormous in Russia. Moreover, it does not capture diversion via the consumption of perks (e.g., a

private jet plane, membership in an exclusive club, a privileged retirement plan or health insurance). Our measures of cash flow diversion, therefore, may significantly underestimate the total private benefits that managers and/or controlling parties enjoy.

### **3. Data and Sample**

As a basis to construct our sample, we use Rosstat, an official Russian statistical agency. This dataset contains information on company identification, dates of incorporation, industry, and basic accounting data, such as information on revenue, profits, income, assets, and debt. The Russian law requires that all firms must submit quarterly reports with balance sheets and income statements to Rosstat. For the period of our research, Rosstat contains accounting data for approximately 2.5 million Russian firms.

We supplement financial data from Rosstat with the database list of banking transactions for the six years between 1999 and 2004. This list was leaked to the public by the Russian Central Bank in 2005. The data for 2003 and 2004 were used in Mironov (2013), who imposes numerous reality checks on the data. This dataset contains 513,169,660 transactions involving 1,721,914 business and government entities. For each transaction, we retrieve the amount, the payer, the recipient, and the self-reported purpose.

We then match the sample with the personal income data for Moscow residents. The data contain 55 million records for the period of 1999–2004. Each entry contains unique identification data for both an employer and an employee. Braguinsky and Mityakov (2014) use these data combined with the auto registration database to estimate the hidden earnings of Muscovites. The employment data are available only for Moscow and for other regions. We select all firms that have at least ten employees and reported revenue at least \$100,000. We impose these restrictions to avoid including very small firms that might

not accurately report their financial data. The sample excludes the four firms explicitly mentioned in the memorandum. After these filters, the final sample consists of 60,401 companies and 156,370 observations (company-year) between 1999 and 2004.

Panel A in Table 1 describes the main features of the companies in our data set. The average (median) company has \$6.2 million (\$522,000) of annual revenue and almost \$7 million (\$180,000) in assets. The average amount of money paid from the firm's bank account (*Total payments*) is \$ 6.8 million. The median value is \$ 390,000. We will use these three company variables to scale income diversion. The average (median) profit margin (*EBT/Revenue*) is 4.1% (1.6%). On average, companies have 11.1% leverage (*Debt/Assets*). The median company is unleveraged.

[Insert Table 1 here]

## 4. Empirical Results

### 4.1 Measuring Income Diversion

Note that not all monies transferred to spacemen constitute cash flow diversion. If a firm pays a spaceman for nonexistent consulting services, then the diversion is 100% of the payment. However, if a firm orders goods from a spaceman, the diversion is a fraction of the transfer. As an illustration, consider a manager who wishes to divert cash by buying a computer above fair price. He or she buys the computer from a spaceman for \$4,000, the spaceman transfers \$1,000 to a real firm that sells computers, the real firm delivers the computer, and the manager receives \$3,000 in “cash back.” In this case, the diversion is \$3,000, not \$4,000. Empirically, we estimate a net transfer to a spaceman as the difference between the money transferred to a spaceman and the money the spaceman transfers to regular firms.

We identify 99,925 spacemen during the period of 1999-2004. On average, each spaceman receives 281 transfers from firms during the sample period for a total amount of \$4.5 million. The

average spaceman performs 100 payments to final suppliers or to other spacemen for a total value of \$1.6 million. Moreover, a spaceman lives, on average, less than 2 years and pays \$340 in taxes over its life.

Following Mironov (2013), we construct three measures of income diversion at the firm level:

$$ShadowP = \frac{Net\ transfers\ to\ spacemen}{Total\ payments},$$

$$ShadowR = \frac{Net\ transfers\ to\ spacemen}{Revenue},$$

$$ShadowA = \frac{Net\ transfers\ to\ spacemen}{Assets}.$$

*Net transfers to spacemen* are net cash transferred to spacemen by a firm, *Total payments* represent total money paid from the firm's bank account, and *Revenue* and *Assets* are book revenue and assets taken from Rosstat.

Panel B in Table 1 shows that, on average, companies in our sample divert 8.7% of revenues, 48% of assets and 8.4% of total bank payments. Comparing the mean and median diversion values in the table, we observe that income diversion is highly skewed by a subset of large companies engaged in massive diversion.

Table 2 shows the top 20 largest companies according to dollar value of income diversion. The largest absolute diverter in our sample is Lukoil, one of the world's largest oil producers, with almost \$7.6 billion dollars accumulated from 1999 to 2004, followed by Gazprom, the largest Russian company, with \$2.2 billion dollars. Lukoil significantly decreased its transfers to spacemen starting in 2002. The sharp decline in income diversion reported in Table 2 translates into an increase in the company's EBITDA Margin (unreported in the table) from 16% in 2001 to 29% in 2002 and a decline in the estimated *ShadowR* measure of income diversion from 8.4% in 2001 to 3.6% in 2002. During the same

period, income diversion, net transfers and *ShadowR* more than doubled for Tatneft, a relatively smaller oil company in Tatarstan that is controlled by the government. Consequently, its EBITDA Margin (unreported in the table) actually decreased from 24% in 2001 to 18% in 2002. Interestingly, state-owned Gazprom significantly increased its transfers to spacemen during the period of 2003-2004. In the next section, we present empirical evidence for our sample showing how Putin's tax enforcement measures curbed income diversion significantly more in large firms.

[Insert Table 2 here]

## 4.2 Income Diversion and Tax Enforcement

### 4.2.1 Firms Explicitly Cited in the Memorandum

Desai et al. (2007) describe in detail the case of Sibneft as an example of the tax enforcement measures implemented by Putin's new administration. These measures formally began with the release of a memorandum in July 2000 by the Russian Ministry of Finance that included a list of the worst corporate tax offenders (four oil companies): Sibneft, Slavneft, Yukos and TNK. After this event, the pressure on Sibneft and other oil companies increased through the rest of 2000 until Summer 2001.

Using our data, we can track Sibneft's annual income diversion through spacemen from 1999 through 2004. Panel A of Figure 1 shows that Sibneft's *ShadowR* increases steadily until 2001, reaching a value of 3.7%, before almost halving to 2% in 2002. Yukos and TNK replicate this pattern. The fourth company in the memorandum, Slavneft, shows a moderate decline in *ShadowR* starting a year earlier, in 2001, before a more significant drop in 2002.<sup>4</sup> This evidence is consistent with an effect of the memorandum on actual diversion by the firms explicitly mentioned in it.

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<sup>4</sup> Yukos' CEO and Chairman, M. B. Khodorkovsky, was arrested in October 2003. The company's shares and assets were thereafter frozen by Putin's government. Slavneft was bought in December of 2002 by Sibneft. Hence, we cannot compute *ShadowR* for Yukos or Slavneft in 2003 and 2004.

An analysis (unreported) of the rate of change in the number of spacemen shows that the rate of creation of new spacemen in these companies starts to decrease in the fourth quarter of 2000, right after the memorandum was released (July 2000). However, firms actually begin to eliminate spacemen (i.e., to show a negative growth rate) only in the last quarter of 2001 and through 2002. Therefore, although the memo was released in July 2000, there is a transition period in which firms gradually adjust until they actually begin to dismantle the evasion mechanism (spacemen) in place. This gap is consistent with inertia in business operations among large companies and could explain the lag in the actual decrease of absolute income diversion since the announcement of the memorandum.

[Insert Figure 1 here]

#### **4.2.2 Evidence of a Spillover Effect**

In this section, we test whether the decrease in income diversion reported in the previous section for the four firms explicitly mentioned in the memorandum extended to other Russian firms. To motivate our analysis, Panel B in Figure 1 shows the evolution of *ShadowR* for the average company in our sample (which excludes the four companies in the memorandum) and compares it to the average value among the four oil companies explicitly cited in the memorandum of July 2000, and the 1% largest firms in the sample in terms of assets each year. The largest companies in our sample exhibit a pattern similar to that of the four companies in the memorandum but starting in the year 2001, that is, a significant decrease in *ShadowR* starting the year after the release of the memorandum. This pattern is in sharp contrast with that of the average firm in our sample, for which *ShadowR* increases every year.

We hypothesize that larger firms reacted more promptly to the threat of tax enforcement after the memorandum was published in July 2000. The largest companies were also the largest evaders, as documented in Table 2. Given the limited resources of the tax authorities, we speculate that these companies immediately discounted that they would be the next target of Putin's hardening on tax

enforcement. Hence, they began to dismantle the evasion structure in place (i.e., spacemen) before the rest of the firms, leading to a sharper decline in income diversion.<sup>5</sup>

To test this hypothesis formally, we construct a new variable, *Large*, which takes a value of one if the company is among the top 1% of largest companies in terms of assets in year 2000 and zero otherwise. We also construct the variable *After 2000*, which takes a value of one for the years 2001 through 2004 and zero otherwise. We also create the variable *After 2001*, which takes a value of one for the years 2002 through 2004 and zero otherwise.

In column (1) of Table 3, we report the results of the regression of income diversion, represented by the variable *ShadowR*, on the interaction between *Large* and *After 2000*. We also include  $\text{Log}(\text{Revenue})$ , *Debt/Assets*, *Year dummies*, and *Firm fixed effects* as control variables (see, for instance, Doidge et al. (2009)).  $\text{Log}(\text{Revenue})$  is the natural logarithm of the company's reported revenue. *Debt/Assets* is the ratio of the company's long-term debt over its total asset value, both at book value. *ShadowR*,  $\text{Log}(\text{Revenue})$ , and *Debt/Assets* are winsorized at the top 95th percentile.<sup>6</sup> The results presented in the table indicate that starting in the year 2001, after the memorandum was released, there was a significant decrease in income diversion among the largest Russian corporations. On average, large firms decreased income diversion by 4.61% of sales from 2001 onward relative to earlier years. This decrease is economically large since it represents more than half of the average *ShadowR*, 8.7% of revenue, as reported in Table 1, and it is statistically significant at the 1% level. In column (2), we repeat the analysis replacing *After 2000* with *After 2001*. The coefficient on the interaction term shows that the reduction in income diversion is not limited to the year 2001: on average, large firms decreased income

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<sup>5</sup> Arguably, other factors may have changed simultaneously for larger relative to smaller companies driving down income diversion. We will study them in the next section.

<sup>6</sup> The set of large companies is stable over the entire sample, hence we do not include the *Large* variable in the regressions since it is subsumed in the *Firm fixed effects*.

diversion by 4.93% of sales relative to earlier years, including 2001. This result shows that income diversion experienced a further decrease in 2002 relative to 2001 and earlier years among the largest firms in Russia, just as documented in Panel A of Figure 1 for the four oil companies in the memorandum.

We analyze the annual evolution of income diversion in column (3). We interact *Large* with a dummy variable per year, from *Y2000* through *Y2004*, and introduce them simultaneously in the regression. We include the same controls as in columns (1) and (2). On average, the evolution of income diversion among the the 1% largest companies in 2000 compared to 1999 is not statistically different from the rest of firms in the sample. In the year 2001, the largest firms diverted 3.38% less compared to the average trend in the sample (significant at the 1% level). Consequently, the *F-test* clearly rejects that these coefficients are the same (*p-value*=0.05%). Thus, 2001 marks the beginning of a new trend among the largest firms in our sample. In 2002 the coefficient is analogous to 2001 (the *F-test* rejects the hypothesis that they are different). It then increases in absolute value in 2003 and levels out in 2004 with an average reduction of 7% in *Shadow R* for the 1% largest firms.

In Table 4 we study what happens when instead of only considering the top 1% largest firms we also analyze the effect of tax enforcement across the largest firms included in percentiles 2-5% and 6-10%, respectively. An interesting pattern emerges. As we consider the effect on relatively smaller firms, the decrease in income diversion (*Shadow R*) fades away. For instance, looking at column (2), income diversion after year 2001 decreases by 4.81% for the top 1% largest firms, 2.61% for the largest 2-5% firms, and 1.47% for the largest 6-10% firms. All the coefficients are significant at the 1% level. The same pattern arises in column (4) when the shock is assumed to take place after year 2000.

Figure 1.C represents this effect graphically. We plot the average annual evolution of *Shadow R* for four consecutive percentile intervals: Top 1%, 2-5%, 6-10%, and 11-20%. Interestingly, as we move

towards relatively smaller companies, the line flattens out, indicating that the effect of tax enforcement on income diversion fades away with firm size. For the average firm included in the top 11-20% percentiles, the effect vanishes completely and *Shadow R* is shown to increase monotonically across years.

[Insert Table 3 here]

[Insert Table 4 here]

## 5. Interpretation and Alternative Explanations

The evidence reported in Panel B of Figure 1 and in Table 3 is consistent with a spillover effect induced by the tax enforcement measures adopted by Putin's administration after his election in 2000. Although the memorandum issued by the Ministry of Finance mentioned only four Russian oil companies, income diversion significantly decreased among the largest companies in different sectors following a very similar time pattern. We have shown that company size (proxied by assets) is a key factor that explains the reach and magnitude of the spillover effect. We first interpret our results in light of our hypothesis. After that, we present and discuss alternative explanations.

We postulate that Russian authorities had limited resources for tax enforcement. Following the memorandum, the largest firms (also the greatest income diverters) would rationally anticipate they were to become the priority of tax authorities under the new and stricter tax enforcement policy. This threat led them to cut income diversion earlier and more aggressively than the rest of the firms. Although we cannot test this hypothesis directly, we can provide some evidence consistent with it. First, the largest firms were also the largest diverters before the memorandum was announced in both absolute and relative terms. Looking at the total amount diverted in Table 2, eight out of the twenty largest diverters

belong to the 1% largest companies in our sample (since they are fiscal residents in Moscow).<sup>7</sup> Looking at relative diversion (scaled by revenue), column (3) in Table 3 shows that *ShadowR* is between 4% and 5% higher for the 1% largest firms in 1999 and 2000. Second, the reduction in income diversion after 2000 is also concentrated among the largest companies. Both quantitatively and statistically, the reduction in income diversion becomes sensibly weaker when we define *Large* as comprising the top 2-5% and, especially, the top 6-10% of largest firms in the sample in Table 4. Third, there are approximately 200 *treatment firms* in our sample per year (firms for which *Large*=1). Although we cannot exclude the possibility that some of these companies were explicitly targeted by the tax authorities, it is more difficult to believe that an explicit warning (equivalent to the memorandum) by the Ministry of Finance or the tax authorities at the full scale might have gone unnoticed. We are not aware of any such reference in the press during the years of our sample, which leads us to believe that the reduction of income diversion among the treatment companies was mostly a spillover effect of the 2000 memorandum. Fourth, tax monitoring and supervision were effectively concentrated around the largest corporations. The number of employees at the central tax office in Moscow in charge of supervising large firms increased fourfold from 1999 to 2004. By contrast, the aggregate increase in the rest of offices in the city was only 20% over the same period.<sup>8</sup>

We next discuss three alternative explanation for our findings.

### 5.1 Putin's "hidden agenda"

With hindsight, one possible alternative interpretation is that Putin targeted larger firms to leverage his power among Russian oligarchs and, ultimately, derive private benefits. This interpretation

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<sup>7</sup> Lukoil, Gazprom, Slavneft, RAO UES, Rosneft, Mosenergo, Rostelekom, and MTS.

<sup>8</sup> According to the Moscow Personal Income Data (see Mironov (2015) for the data description), the number of employees at the tax office that supervises the largest taxpayers increased from 92 in 1999 to 292 in 2004, whereas the total number of employees in the 33 district tax offices increased from 8,004 in 1999 to 9,550 in 2004.

is consistent with the fate of Yukos. In October 2003, Khodorkovsky—CEO and Chairman of Yukos—was arrested. From 2003-2004 onward, the Russian government claimed unpaid taxes from Yukos for a total amount of U.S. \$27 billion. Between 2004 and 2007, most of Yukos's assets were seized by the Russian government and sold for a fraction of their value to the state-owned oil company Rosneft. Nevertheless, some evidence conflicts with this hypothesis. First, Table 3 shows that the reduction in income diversion began in 2001 and increased during 2002, before the expropriation of Yukos. Second, nobody seemed to anticipate at that point Putin's "hidden agenda." In the words of Bill Browder, CEO and founder of Hermitage Capital Investment, "I naively thought that Putin was acting in the national interest and was genuinely trying to clean up Russia." (Browder (2015), p. 160). The market's reaction pointed in the same direction. Desai et al. (2007) show that investors positively evaluated Putin's actions: the market price of Sibneft and other oil and gas companies significantly increased after Putin's stronger stance on tax evasion was made public. Moreover, according to the IMF, foreign direct investment in Russia grew by 26%, 130% and 94% in the years 2002, 2003, and 2004, respectively. Although these facts do not prove anything by themselves, they are difficult to reconcile with the higher risk of expropriation and suggest that foreign and local investors positively reacted to Putin's policies at that point.

## **5.2 Tax evasion versus tax optimization**

One could argue that the transactions with spacemen were used as the means for tax optimization in the interests of all shareholders, including minority shareholders, which would question our interpretation of these transactions as income diversion. There are three arguments against this interpretation. First, the cost-inflation strategies implemented through spacemen are actual cash outflows, not just accounting manipulation. In the case of public companies, money cannot be returned to minority shareholders once it leaves the company. Second, even if we were to admit that these

transactions are ultimately value enhancing for all shareholders, how can we explain the severe undervaluation of these companies relative to their Western peers? Black (2001) documents that the average company in his sample (which includes many of our companies) trades at only 6% of the market value of equivalent Western companies in 1999.<sup>9</sup> Third, we observe among several large firms very dramatic increases in cash dividends around the implementation of stricter tax enforcement: *Lukoil*, for instance, increased its cash dividends by 483% in 2001 and 285% in 2002; *Norilsk Nickel*, by 591% and 1,508% in 2001 and 2002, respectively. Desai et al. (2007) report that Sibneft paid dividends for the first time in November 2000 (\$53 million) and paid close to \$1 billion in 2001. Although we cannot discard the possibility that firms used alternative mechanisms to expropriate cash flow, this evidence is consistent with a value redistribution toward minority shareholders after the reduction in income diversion via spacemen.

### **5.3 Omitted variables and the role of corporate governance**

Finally, an alternative explanation of our finding may lie in some omitted variable that is driving inversely and simultaneously income diversion and company size after 2000. Corporate governance, for instance, may have improved first for larger relative to smaller firms around that year.<sup>10</sup> We cannot completely rule out this possibility. Some facts, however, seem to point against it. First, *treatment* firms in our sample are fairly diverse in many dimensions (including size), which lowers the likelihood of an omitted variable or set of variables driving our results.<sup>11</sup>

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<sup>9</sup> Incidentally, the accumulated diverted cashflows from Lukoil in 2000 and 2001 reported in Table 2 represent 99.3% of the company's market capitalization as of December 2000.

<sup>10</sup> For instance, major changes in the statutory rules governing dual-class stock in Russia took effect on January 1, 2002. These changes concerned the regulation of related party transactions, the composition of supervisory boards, procedures for putting proposals to shareholder meetings, the protection of non-voting (preferred) shareholders, etc. Muravyev (2013) finds evidence consistent with a significant effect of these changes on company value and private benefits of control.

<sup>11</sup> In 2000, for instance, the top 1% largest firms by total assets include 220 companies from 35 industries, including construction, wholesale trade, retail, mining, food, clothes, chemical, electronic, machinery, utilities and services among

Second, we specifically control for firm-level corporate governance for a subset of firms. In particular, we hand-collect data from the annual company reports of almost every publicly listed company in Russia from 1999 through 2004 to construct the following variables: *ADR*, which is a variable that takes a value of one if a company has American Depositary Receipts (ADRs) and zero otherwise; *Audit by Big 5*, which is a variable that takes a value of one if a company is audited by one of the Big 5 accounting firms (Arthur Andersen, Deloitte, Ernst & Young, KPMG, or PWC) and zero otherwise; and *CEO on board* and *Foreigner on board*, which are variables that take a value of one if the CEO has a seat on the board or a foreigner serves on the board, respectively, and zero otherwise.<sup>12</sup> The final sample consists of 153 firms and 681 company-year observations.<sup>13</sup>

Each year, the variable *Large* takes a value of one if the company belongs to the top 10% in terms of market capitalization as of the year 2001 and zero otherwise.<sup>14</sup> Like in Table 3, we interact the variable *Large* with *After 2000* in Panel A and the variable *After 2001* in Panel B of Table 5. We include the same controls as in Table 3 plus an additional control, *Government ownership > 20%*, which takes a value of one if the government owns more than 20% of the company shares and zero otherwise (a threshold of 50% yields similar results).

Consistent with the evidence reported in column (2) of Table 3, *ShadowR* decreases 1.5% for the largest firms after 2001.<sup>15</sup> This result is economically meaningful (the average annual *Shadow R* among

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others. Total assets vary from 45 million dollars to 39 billion dollars (Gazprom). The average (median) assets are 405 (96) million dollars, with a standard deviation of 2.6 billion dollars. We identify 41% of companies as either federal, regional, or municipally owned through the prefix “FGUP”, “GUP”, or “MUP”, respectively. We cannot exclude that the rest of the companies are partially owned by the government.

<sup>12</sup> The literature has studied other corporate variables, including the threat of dismissal measured by CEO turnover, the ownership concentration, CEO stock ownership, and shareholder activism (e.g., Dyck et al. (2008)). Unfortunately, data limitations do not allow us to construct these variables.

<sup>13</sup> We describe in detail the procedure to construct this data set in the Appendix. The firms’ characteristics and the corporate governance variables are described in Table A.1; the statistics from the three measures of income diversion are reported in Table A.2. The four companies explicitly cited in the memorandum are excluded from the analysis.

<sup>14</sup> The top 10% largest firms in terms of market capitalization are Lukoil, Gazprom, Severstal, Norilsk Nickel, Tatneft, Mosenergo, Mobile Telesystem, MMK, and Surgutneftegaz.

<sup>15</sup> There is no statistically significant effect on income diversion when we replace *After 2001* with *After 2000*.

the largest companies in the sample is 2.2%) and statistically significant at the 5% level. This result is robust after controlling for all the corporate governance variables. Only the variable Audit by Big 5 turns out to be (marginally) significant at the 10% level when interacted with *Large* and *After 2000* (*After 2001*). The negative sign, however, is the opposite of what the model of Desai et al. (2007) predicts: auditing by one of the Big 5 companies seems to work as a complement rather than substitute for tax enforcement in curbing income diversion. Interpreting this as evidence against the prediction of a substitution between tax enforcement and corporate governance from the model of Desai et al. (2007) should be taken with caution. From an empirical point of view, corporate governance is endogenously determined, and we lack any identification strategy for the companies' choice regarding governance quality and institutions. Moreover, our sample size is rather small, and there is little variation in governance variables, especially among large firms.

[Insert Table 5 here]

## 6. Conclusion

Using a unique set of banking transaction data for large public Russian corporations, we have investigated the efficacy of tax enforcement in reducing income diversion. In particular, we have employed a metric developed by Mironov (2013), income diversion by spacemen, to directly estimate income diversion among a large set of Russian firms, and we have used these estimates to study the effect of stricter tax enforcement in 2000, after Vladimir Putin became Russia's President, on income diversion.

The estimated magnitude of income diversion is sizeable, amounting, on average, to 8.7% of company revenue or per year. The evidence supports the role of tax enforcement in curbing income diversion. Companies explicitly mentioned in a memorandum issued by the Ministry of Finance that were suspected of tax avoidance showed a drastic decrease in income diversion after 2001. In addition,

the decline in income diversion among the largest 1% firms by total assets after the release of the memorandum is significantly higher than that for the rest of the sample firms. We interpret this as evidence consistent with a spillover effect of the tax enforcement measures initiated with the memorandum.

Finally, we fail to find any evidence of an interrelation between firm-level governance variables and income diversion for a smaller set of listed companies. These results cast doubt on the efficacy of corporate governance mechanisms that are typically used in advanced economies to limit income diversion in emerging economies. This evidence from Russia may illustrate potential issues in other emerging economies. Russia is the sixth largest economy in the world, with a per capita GDP of \$25,533.<sup>16</sup> This figure is approximately equal to that of Eastern European countries, such as Greece, Latvia, Hungary, and Romania. However, the level of corruption in Russia is extremely high, similar to that of countries that are three to four times poorer. The 2017 Corruption Perceptions Index produced by Transparency International ranked Russia 135 out of 180 countries, at the same level as Kyrgyzstan, Paraguay, Papua New Guinea, and Honduras.

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<sup>16</sup> Worldbank, 2017

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**Table 1**  
**Summary Statistics**

Panel A presents summary statistics for the sample of companies from 1999 through 2004. *Revenue*, *Assets*, *EBIT* (Earnings Before Interest and Taxes), and *Debt* are taken from Rosstat. *Total payments* represents the total amount of money paid from the firm's bank account. This information was leaked to the public by the Russian Central Bank in 2005. Panel B presents the three income diversion measures.  $ShadowR = Net\ transfers\ to\ spacemen / Revenue$ ,  $ShadowA = Net\ transfers\ to\ spacemen / Assets$ , and  $ShadowP = Net\ transfers\ to\ spacemen / Total\ payments$ , where *Net transfers to spacemen* is the net cash transferred to spacemen by a firm. The three measures are winsorized at the top 95th percentile.

	Mean (1)	Median (2)	St. dev. (3)	N. of obs. (4)	N. of firms (5)
Panel A. Firm accounting data					
Revenue, \$000's	6,191	522	232,548	156,370	60,401
Assets \$000's	6,907	180	421,902	156,370	60,401
Total payments \$000's	6,846	390	449,870	156,370	60,401
EBT, \$000's	532	9	33,907	155,115	60,086
EBT / Revenue	0.041	0.016	0.079	155,115	60,086
Debt / Assets	0.111	0.000	0.225	156,370	60,401
Panel B. Income diversion measures					
ShadowR	0.087	0.022	0.136	156,370	60,401
ShadowA	0.480	0.052	0.966	156,370	60,401
ShadowP	0.084	0.027	0.119	156,370	60,401

**Table 2**  
**Income Diversion by Top Listed Russian Companies**

The table shows the top 20 largest listed companies according to accumulated income diversion (\$000's) for the period between 1999 and 2004. Income diversion is measured as net transfers to affiliated spacemen. A firm is defined as a spaceman if it satisfies all the following criteria: (a) the ratio of taxes paid to the difference in cash inflows and outflows (net tax rate) is less than 0.1%; (b) the firm pays less than \$7.2 in Social Security taxes per month, an amount that approximately corresponds to Social Security taxes paid on the salary of one minimum wage worker; and (c) the firm's cash inflows exceed its outflows.

Ticker	Name	1999	2000	2001	2002	2003	2004	Total
LKOH	Lukoil	146,207	3,134,821	3,647,323	263,772	228,527	174,024	7,594,674
GAZP	Gazprom	54,278	107,446	141,176	141,459	587,887	1,152,517	2,184,763
CHMF	Severstal	73,649	147,183	177,769	53,926	94,647	360,786	907,959
GMKN	Norilsk Nickel	38,728	193,251	443,168	80,928	20,724	76,340	853,139
TNKO	TNK	104,396	102,544	156,772	71,255	89,691	191,880	716,538
SLAV	Slavneft	21,688	125,473	110,654	75,628	72,041	196,914	602,398
CEESR	RAO UES	4,967	29,798	61,953	57,705	161,083	174,128	489,634
ROSN	Rosneft	35,681	90,669	115,126	49,310	60,458	127,281	478,525
SDNK	Sidanko	30,895	73,684	184,095	171,136	7,193	10,925	477,928
TATN	Tatneft	25,135	72,253	42,344	97,873	100,554	29,105	367,265
NLMK	NLMK	27,625	43,348	38,356	47,563	121,348	78,177	356,417
YUKO	Yukos	20,350	73,233	74,505	40,260	74,035	48,098	330,482
MSNG	Mosenergo	1,511	6,346	16,322	6,587	75,771	18,433	124,970
AGKK	Rusal Mikha.	5,482	16,728	49,889	12,962	14,769	25,124	124,953
MGOK	GOK	1,359	6,443	2,039	1,467	33,264	79,345	123,917
UDMN	Udmurneft	1,124	4,003	9,660	513	38,665	56,004	109,969
PFGS	Rosneft-Purn.	8,525	23,394	14,735	4,022	13,550	25,376	89,601
NVTK	Novatek	7,999	25,888	16,463	3,458	13,594	17,519	84,920
RTKM	Rostelekom	3,214	3,430	7,580	12,649	27,650	27,128	81,651
CHMK	ChMK	.	40,791	17,077	2,968	4,696	14,140	79,673

Table 3

### Income Diversion and Tax Enforcement

Panel A shows the OLS regression of  $ShadowR = Net\ transfers\ to\ spacemen/Revenue$  on a set of variables. *Large* takes a value of one if the firm belongs to the top 1% largest companies by assets in year 2000 and zero otherwise. *After 2000* (alternatively, *After 2001*) takes a value of one in the years 2001 through 2004 (alternatively, in years 2002 through 2004) and zero otherwise. *Y1999* through *Y2004* take a value of one in the corresponding year and zero otherwise. We control for the company's size as proxied by (Log) *Revenue* and leverage, *Debt/Assets*, as well as *Year* and *Firm fixed effects*. Standard errors are in parentheses. They are clustered at the firm level. \*\*\*, \*\*, and \* denote significance at the 1%, 5% and 10% levels, respectively. *ShadowR*,  $\log(Revenue)$ , and *Debt/Assets* are winsorized at the top 95th percentile. Panel B presents the results of the F-test on the likelihood that two consecutive coefficients from the regressions of *ShadowR* on  $Year\#\#Large$  are equal for # ranging from 2000 through 2004.

Panel A. OLS regressions			
	ShadowR		
	(1)	(2)	(3)
After 2000*Large	-0.0461 (0.0077)***		
After 2001*Large		-0.0493 (0.0086)***	
Y2000*Large			-0.0043 (0.0107)
Y2001*Large			-0.0338 (0.0123)***
Y2002*Large			-0.0414 (0.0119)***
Y2003*Large			-0.0658 (0.0117)***
Y2004*Large			-0.0705 (0.0136)***
Log (Revenue)	-0.0127 (0.0007)***	-0.0127 (0.0007)***	-0.0127 (0.0007)***
Debt/Assets	0.0109 (0.0027)***	0.0109 (0.0027)***	0.0108 (0.0027)***
Year dummy	Y	Y	Y
Fixed effects	Y	Y	Y
R-sq	0.022	0.022	0.022
Number of obs.	156,370	156,370	156,370
Number of firms	60,401	60,401	60,401
Panel B. F-tests on the difference between coefficients			
Test	F(1; 60,400)	Prob. >F	
Y2000*Large=Y2001*Large	12.07	0.0005	
Y2001*Large=Y2002*Large	0.81	0.3691	
Y2002*Large=Y2003*Large	16.00	0.0001	
Y2003*Large=Y2004*Large	0.58	0.4468	

Table 4

### Income Diversion and Tax Enforcement

Panel A shows the OLS regression of  $ShadowR = Net\ transfers\ to\ spacemen/Revenue$  on a set of variables. *Large* takes a value of one if the firm belongs to the top 1% largest companies by assets in year 2000 and zero otherwise. *Large 2-5%* (alternatively, *Large 6-10%*) takes a value of one if the firm belongs to the top 2-5% (alternatively, 6-10%) largest companies by assets in year 2000 and zero otherwise. *After 2000* (alternatively, *After 2001*) takes a value of one in the years 2001 through 2004 (alternatively, in years 2002 through 2004) and zero otherwise. We control for the company's size as proxied by (Log) *Revenue* and leverage, *Debt/Assets*, as well as *Year* and *Firm fixed effects*. Standard errors are in parentheses. They are clustered at the firm level. \*\*\*, \*\*, and \* denote significance at the 1%, 5% and 10% levels, respectively. *ShadowR*, *Log (Revenue)*, and *Debt/Assets* are winsorized at the top 95th percentile.

	ShadowR			
	(1)	(2)	(3)	(4)
After 2001*Large	-0.0473 (0.0077)***	-0.0481 (0.0077)***		
After 2001*Large 2-5%	-0.0253 (0.0035)***	-0.0261 (0.0035)***		
After 2001*Large 6-10%		-0.0147 (0.0029)***		
After 2000*Large			-0.0504 (0.0086)***	-0.0508 (0.0086)***
After 2000*Large 2-5%			-0.0204 (0.0037)***	-0.0208 (0.0037)***
After 2000*Large 6-10%				-0.0071 (0.0029)**
Log(Revenue)	-0.0128 (0.0007)***	-0.0128 (0.0007)***	-0.0127 (0.0007)***	-0.0127 (0.0007)***
Debt/Assets	0.0108 (0.0027)***	0.0109 (0.0027)***	0.0108 (0.0027)***	0.0108 (0.0027)***
Year dummy	Y	Y	Y	Y
Fixed effects	Y	Y	Y	Y
R-sq	0.022	0.023	0.022	0.022
Number of obs.	156,370	156,370	156,370	156,370
Number of firms	60,401	60,401	60,401	60,401

Table 5

**Sample of Companies with Corporate Governance Variables**  
**Income Diversion and Tax Enforcement**

This table shows the OLS regression of  $ShadowR = Net\ transfers\ to\ spacemen/Revenue$  on a set of variables. *Large* takes a value of one if the firm belongs to the top 10% largest companies by market capitalization in year 2001 and zero otherwise. *After 2000* in Panel A (alternatively, *After 2001* in Panel B) takes a value of one in the years 2001 through 2004 (alternatively, in the years 2002 through 2004) and zero otherwise. All the variables are defined in Table A.2. The four companies cited in the memorandum from July 2000 have been removed. Standard errors are in parentheses. They are clustered at the firm level. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively. *ShadowR*,  $\log(Board\ size)$ ,  $\log(Revenue)$ , and  $Debt/Assets$  are winsorized at the top 95th percentile.

Panel A. After 2000

	ShadowR						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
After 2000*Large	-0.0041 (0.0058)	-0.0025 (0.0041)	0.0014 (0.0054)	-0.0016 (0.0043)	0.0002 (0.0046)	0.0150 (0.0224)	0.0079 (0.0105)
ADR		-0.0125 (0.0137)	0.0144 (0.0052)***				
After 2000*ADR			0.0101 (0.0074)				
Large*ADR			-0.0501 (0.0191)***				
After 2000*Large*ADR			-0.0064 (0.0046)				
Audit by Big 5		0.0007 (0.004)		0.0077 (0.0055)			
After 2000*Audit by Big 5				0.0024 (0.0108)			
Large*Audit by Big 5				-0.0119 (0.0112)			
After 2000*Large*Audit Big 5				-0.0076 (0.0041)*			
Foreigner serves on board		0.0029 (0.0053)			0.0142 (0.0065)**		
After 2000*Foreigner					0.0134 (0.0084)		
Large*Foreigner					-0.0430 (0.0196)**		
After 2000*Large*Foreigner					-0.0079 (0.0068)		
Log (Board size)		0.0018 (0.0051)				0.0022 (0.0054)	

After 2000*Log (Board size)						-0.0081	
						(0.0092)	
Large*Log (Board size)						.	
After 2000*Large*Log (B. size)						-0.0015	
						(0.0043)	
CEO on board		-0.0023					0.0004
		(0.0026)					(0.0055)
After 2000*CEO on board							-0.0138
							(0.0125)
Large*CEO on board							.
After 2000*Large*CEO on board							-0.0019
							(0.0054)
Government ownership>20%	0.0015	0.0020	0.0018	0.0016	0.0012	0.0013	0.0017
	(0.0021)	(0.0022)	(0.0021)	(0.0022)	(0.0021)	(0.0022)	(0.0023)
Log(Revenue)	-0.0046	-0.0042	-0.0049	-0.0042	-0.0045	-0.0046	-0.0046
	(0.0024)*	(0.0024)*	(0.0026)*	(0.0024)*	(0.0025)*	(0.0025)*	(0.0024)*
Debt/Assets	0.0052	0.0049	0.0054	0.0035	0.0035	0.0052	0.0040
	(0.0082)	(0.0082)	(0.0084)	(0.0084)	(0.0083)	(0.0083)	(0.0084)
Year dummy	Y	Y	Y	Y	Y	Y	Y
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y
R-sq.	0.047	0.055	0.066	0.053	0.077	0.047	0.053
Number of obs.	681	681	681	681	681	681	681
Number of firms	153	153	153	153	153	153	153

### Panel B. After 2001

	ShadowR						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
After 2001*Large	-0.0151	-0.0156	-0.0124	-0.0230	-0.0119	-0.0284	-0.0220
	(0.0088)*	(0.0078)**	(0.0087)	(0.0146)	(0.006)**	(0.0576)	(0.0177)
ADR		-0.0078	0.0124				
		(0.0114)	(0.0044)***				
After 2001*ADR			0.0088				
			(0.0142)				
Large*ADR			-0.0374				
			(0.0201)*				
After 2001*Large*ADR			-0.0051				
			(0.0038)				
Audit by Big 5		0.0013		0.0075			
		(0.004)		(0.0049)			
After 2001*Audit by Big 5				0.0203			

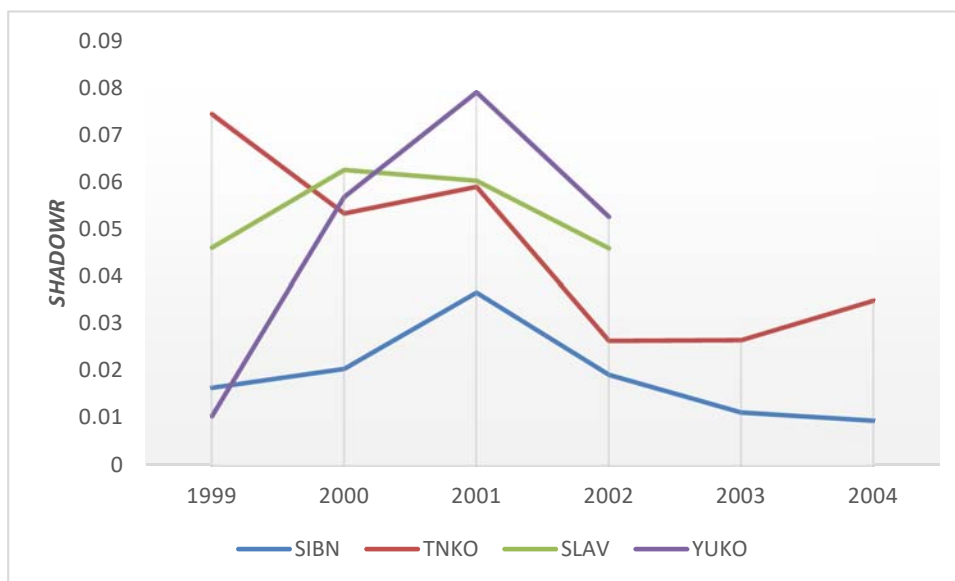
					(0.0196)		
Large*Audit by Big 5					-0.0119		
					(0.0136)		
After 2001*Large*Audit Big 5					-0.0097		
					(0.0051)*		
Foreigner serves on board	0.0051				0.0097		
	(0.0049)				(0.0053)*		
After 2001*Foreigner					0.0164		
					(0.0088)*		
Large*Foreigner					-0.0374		
					(0.0187)**		
After 2001*Large*Foreigner					-0.0019		
					(0.0068)		
Log (Board size)	0.0016				0.0065		
	(0.005)				(0.0053)		
After 2001*Log (Board size)					0.0065		
					(0.0242)		
Large*Log (Board size)					.		
After 2001*Large*Log (B. size)					-0.0074		
					(0.0047)		
CEO on board	-0.0018					0.0006	
	(0.0025)					(0.0031)	
After 2001*CEO on board						0.0088	
						(0.0173)	
Large*CEO on board						-0.0147	
						(0.0184)	
After 2001*Large*CEO on board						-0.0027	
						(0.0033)	
Government ownership>20%	0.0008	0.0012	0.0010	0.0011	0.0008	0.0003	0.0010
	(0.0023)	(0.0024)	(0.0023)	(0.0025)	(0.0022)	(0.0025)	(0.0025)
Log(Revenue)	-0.0045	-0.0042	-0.0048	-0.0038	-0.0045	-0.0046	-0.0045
	(0.0024)*	(0.0025)*	(0.0026)*	(0.0023)*	(0.0025)*	(0.0025)*	(0.0024)*
Debt/Assets	0.0055	0.0058	0.0057	0.0014	0.0044	0.0063	0.0049
	(0.0084)	(0.0082)	(0.0085)	(0.0087)	(0.0081)	(0.0083)	(0.0085)
Year dummy	Y	Y	Y	Y	Y	Y	Y
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y
R-sq.	0.061	0.069	0.071	0.073	0.078	0.066	0.066
Number of obs.	681	681	681	681	681	681	681
Number of firms	153	153	153	153	153	153	153

Figure 1

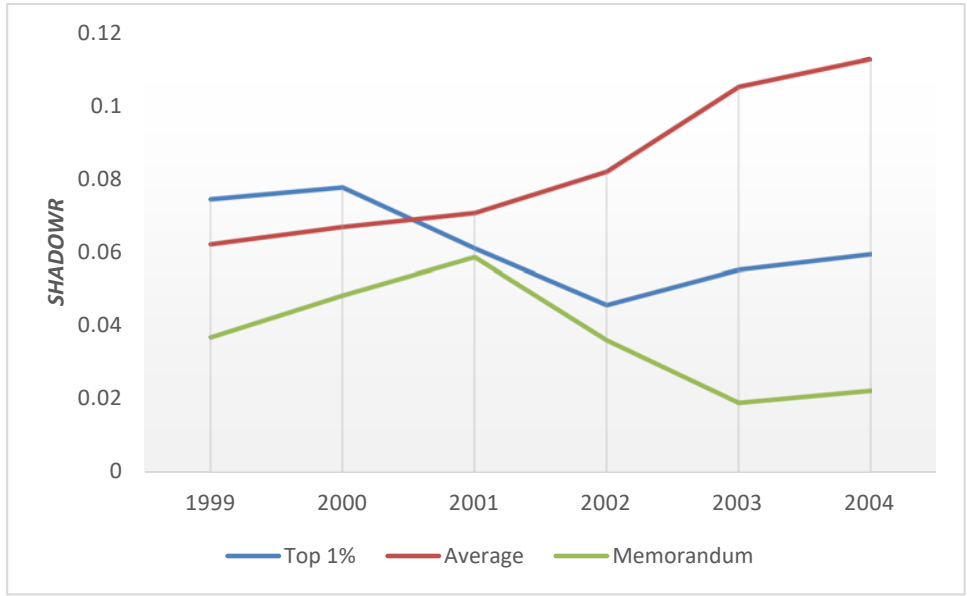
### Evolution of Income Diversion for Different Sets of Companies

We represent the evolution of  $ShadowR = Net\ transfers\ to\ spacemen / Revenue$  from 1999 through 2004. Net transfers to spacemen is the net cash transferred to spacemen by a firm. Panel A includes the four firms in the 2000 memorandum: Sibneft (SIBN), Slavneft (SLAV), Yukos (YUKO), and TNK (TNKO). In Panel B, *Memorandum* represents the average income diversion per year of the four firms in the memorandum; *Average* represents the average income diversion across all firms in our sample; and *Top 1%* is the average income diversion among the top 1% largest companies by assets in the corresponding year. In Panel C, *Average 2-5%*, *Average 6-10%*, and *Average 11-20%* represent the average *Shadow R* in the corresponding percentile interval of largest companies in assets in the corresponding year.

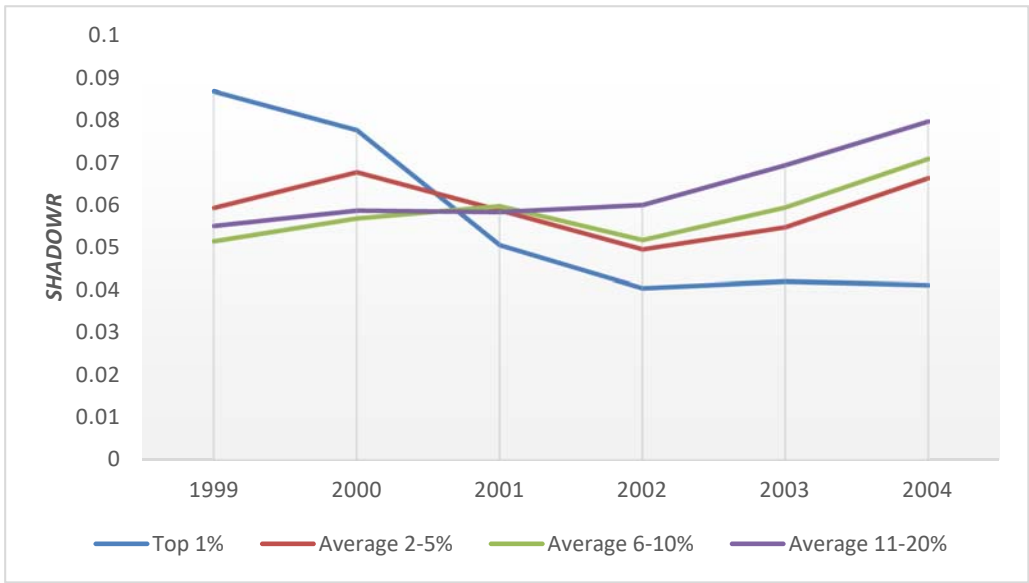
Panel A. Companies in the memorandum



Panel B. Large companies (top 1%) vs. sample average and average of companies in the memorandum



Panel C. Large companies (top 1%) vs. average in three different percentile ranges



## Appendix

### Sample of Companies with Corporate Governance Variables

#### Sample Construction

To construct a sample for this research, we start with the list of publicly traded companies in 2003. We have chosen these companies because they have publicly available governance information even for the years before they become public. The corporate governance data are manually collected from company reports.<sup>17</sup> Because large Russian companies typically divert cash flow through affiliate entities, we restrict the sample to companies that have lists of affiliates.<sup>18</sup> Then, we merge this sample with banking transaction data that cover the period from 1999 to 2004 and contain information on 513,169,660 transactions involving 1,721,914 business and legal government entities and self-employed entrepreneurs without legal enterprise status. The banking data include the date of each transaction, the payer, the recipient, the amount paid, and the self-reported purpose of the transaction. Mironov (2013) imposes numerous reality checks on these data. Finally, to control for the accuracy of the banking data, company receipts and payments must be consistent with reported revenue.<sup>19</sup> These filters yield a final sample of 153 companies and 681 company-year observations for the period of 1999-2004.<sup>20</sup> Although

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<sup>17</sup> The Federal Financial Market Service (FFMS) requires that companies trading on the Russian Trading System (RTS) submit yearly reports containing, *inter alia*, information on the board composition and the company's auditor. Moreover, the regulator requires companies to disclose data from previous years when they go public. Nevertheless, historical reports were not always available because there is no legal requirement that firms retain them. We need these data to construct the governance variables in our tests. Additionally, the fact that a company reports this information adds an extra layer of credibility to the remainder of the reported data.

<sup>18</sup> Most affiliates can be identified from company reports in the years 2003 and 2004. Data on affiliates prior to 2003 are, in many cases, unavailable. We assume that affiliate companies in 2003 were also affiliates during the period of 1999-2002. For the total sample of 153 companies, we find more than 7,000 affiliates during the period of 1999-2004. Matching this list of affiliates to the banking database, we identify approximately 1,661 affiliates that sent funds to more than 11,000 spacemen. For example, we identify 212 affiliates of Gazprom, 68 affiliates of Lukoil, and 29 affiliates of Norilsk Nickel. Failing to account for these affiliates would severely bias our results for this sample of relatively larger, publicly listed companies. It is certainly a lesser concern for the large sample used in the main analysis since most companies in that sample are not large enough to have affiliates.

<sup>19</sup> Specifically, we include only firms for which  $|\text{Log}(\text{Receipts} + \text{Payments}) - \text{Log}(\text{Revenue})| < \text{Log}(10)$ .

<sup>20</sup> In the first year of our sample, 1999, the number of firms that satisfy the three filters is only 57. The number of observations increases year by year. This is because the further we move back in time, the less the information collected in 2003-2004

this number may seem relatively small, it is significantly larger than those in previous studies on Russian data, such as Black (2001). The sample includes the vast majority of listed Russian firms for each year.

Using information from quarterly reports submitted to the FFMS, we code the following variables related to corporate governance. *ADR* is a variable that takes a value of one if a company has ADRs and zero otherwise.<sup>21</sup> *Audit by Big 5* is a variable that takes a value of one if a company is audited by one of the Big 5 accounting firms (Arthur Andersen, Deloitte, Ernst & Young, KPMG, or PWC) and zero otherwise. *Board size* is the number of directors serving on a company's board. *CEO on board* and *Foreigner on board* are variables that take a value of one if the CEO has a seat on the board or a foreigner serves on the board, respectively, and zero otherwise.<sup>22</sup>

We include the same controls as in Table 3 in the paper plus an additional control, *Government ownership > 20%*, defined as a variable that takes a value of one if the government owns more than 20% of the company shares and zero otherwise (a threshold of 50% yields similar results).

Table A.1

### **Sample of Companies with Corporate Governance Variables Summary Statistics**

The table presents summary statistics for the sample of 153 companies for which we could manually collect governance variables. Panel A reports the statistics for the entire sample. Panel B (alternatively, Panel C) reports the statistics for the top 10% (alternatively, non-top 10%) of publicly traded companies according to market capitalization in 2001. *Revenue*, *Assets*, *EBITDA* (Earnings before Interest, Taxes, Depreciation and Amortization), and *Debt* are taken from Rosstat. *Total payments* represents the total amount of money paid from the firm's bank account. This information was leaked to the

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(i.e., affiliate lists) corresponds to the actual data. In addition, the annual reports for 1999-2000 were more difficult to obtain for earlier years than for later years.

<sup>21</sup> Our data do not distinguish between Level 1 ADRs, which trade Over-The-Counter, and Level 2 and 3 ADRs, which are directly listed on U.S. stock exchanges. Although this distinction may have important implications for the effective monitoring pressure in place, our limited sample size of cross-listed firms does not allow for such tests. During the sample period, no Russian firm traded as an ADR in Hong Kong, and only 3 Russian companies (Lukoil, Gazprom and Tatneft) were listed on the London Stock Exchange. These companies were also listed on the New York Stock Exchange.

<sup>22</sup> The literature has studied other corporate variables, including the threat of dismissal measured by CEO turnover, ownership concentration, CEO stock ownership, and shareholder activism (e.g., Dyck et al. (2008)). Unfortunately, data limitations do not allow us to construct these variables.

public by the Russian Central Bank in 2005. The remaining variables are manually collected from companies' quarterly reports. *ADR* is a variable that takes a value of one if the company has American Depositary Receipts (ADRs) and zero otherwise. *Audit by Big 5* is a variable that takes a value of one if the company is audited by one of the Big 5 accounting firms (Arthur Andersen, Deloitte, Ernst & Young, KPMG, or PWC) and zero otherwise. *Board size* is the number of directors serving on the company's board. *CEO on board* and *Foreigner on board* are variables that take a value of one if the CEO has a seat on the board or a foreigner serves on the board, respectively. *Government ownership>20%* is a variable that takes a value of one if the government owns more than 20% of the company shares and zero otherwise.

	Mean (1)	Median (2)	St. dev. (3)	N of obs. (4)	N of firms (5)
<b>Panel A. Summary statistics for the entire sample</b>					
Revenue, \$000's	669,938	140,804	2,239,262	681	153
Assets \$000's	1,252,014	172,476	6,512,367	681	153
Total payments \$000's	637,036	51,834	3,231,008	681	153
EBITDA, \$000's	140,145	8,154	578,058	676	153
EBITDA / Revenue	0.114	0.085	0.122	676	153
Debt / Assets	0.165	0.116	0.155	681	153
Publicly traded	0.640	1.000	0.480	681	153
ADR	0.073	0.000	0.261	681	153
Audit by Big 5	0.178	0.000	0.383	681	153
Board size	8.435	8.000	2.639	681	153
CEO ownership	0.016	0.000	0.064	672	151
CEO on board	0.840	1.000	0.367	681	153
Foreigner on board	0.140	0.000	0.347	681	153
Government ownership>20%	0.279	0.000	0.449	681	153
<b>Panel B. Summary statistics for Top 10% publicly traded companies</b>					
Revenue, \$000's	5,808,759	3,429,830	6,457,938	47	9
Assets \$000's	12,884,471	4,288,288	21,596,336	47	9
Total payments \$000's	6,753,481	2,348,081	10,366,722	47	9
EBITDA, \$000's	1,498,892	928,628	1,622,405	47	9
EBITDA / Revenue	0.249	0.254	0.119	47	9
Debt / Assets	0.157	0.163	0.110	47	9
Publicly traded	0.936	1.000	0.247	47	9
ADR	0.596	1.000	0.496	47	9
Audit by Big 5	0.596	1.000	0.496	47	9
Board size	10.277	10.000	2.627	47	9
CEO ownership	0.013	0.001	0.041	47	9
CEO on board	0.872	1.000	0.337	47	9
Foreigner on board	0.340	0.000	0.479	47	9
Government ownership>20%	0.298	0.000	0.462	47	9
<b>Panel C. Summary statistics for non-top 10% publicly traded companies</b>					
Revenue, \$000's	288,984	123,221	499,809	634	144
Assets \$000's	389,671	137,491	935,282	634	144
Total payments \$000's	183,609	43,176	648,938	634	144
EBITDA, \$000's	38,617	6,721	133,640	629	144

EBITDA / Revenue	0.103	0.075	0.117	629	144
Debt / Assets	0.165	0.113	0.158	634	144
Publicly traded	0.618	1.000	0.486	634	144
ADR	0.035	0.000	0.183	634	144
Audit by Big 5	0.147	0.000	0.354	634	144
Board size	8.298	8.000	2.590	634	144
CEO ownership	0.016	0.000	0.065	625	142
CEO on board	0.838	1.000	0.369	634	144
Foreigner on board	0.125	0.000	0.331	634	144
Government ownership>20%	0.278	0.000	0.448	634	144

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Table A.2  
**Sample of Companies with Corporate Governance Variables**  
**Summary Statistics for Income Diversion**

The table presents income diversion measures.  $ShadowR = Net\ transfers\ to\ spacemen / Revenue$ .  $ShadowA = Net\ transfers\ to\ spacemen / Assets$ . and  $ShadowP = Net\ transfers\ to\ spacemen / Total\ payments$  for the sample of 153 companies for which we could manually collect governance variables. Panel A reports the statistics for the entire sample. Panel B (alternatively, Panel C) reports the statistics for the top 10% (alternatively, non-top 10%) of companies according to market capitalization in 2001. *Net transfers to spacemen* is the net cash transferred to spacemen by a firm. *Total payments* represents the total amount of money paid from the firm's bank account. This information was leaked to the public by the Russian Central Bank in 2005. *Revenue* and *Assets* are book revenue and assets taken from Rosstat. The three measures of income diversion are winsorized at the top 95th percentile.

	Mean	Median	St. dev.	N of obs.	N of firms
Panel A. Summary statistics for the entire sample					
ShadowR	0.018	0.007	0.023	681	153
ShadowA	0.017	0.006	0.024	681	153
ShadowP	0.027	0.017	0.030	681	153
Panel B. Summary statistics for top 10% market cap in 2001					
ShadowR	0.022	0.011	0.026	47	9
ShadowA	0.021	0.007	0.028	47	9
ShadowP	0.021	0.009	0.026	47	9
Panel C. Summary statistics for non-top 10% market cap in 2001					
ShadowR	0.017	0.007	0.023	634	144
ShadowA	0.016	0.006	0.023	634	144
ShadowP	0.028	0.018	0.030	634	144