Tax Enforcement, Corporate Governance, and Income Diversion: Evidence after Putin's election in 2000

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Abstract

Using a direct estimate of income diversion for 156 firms from 1999 through 2004, we show that an increase in tax enforcement following the election of Vladimir Putin in 2000 is associated with a decrease in the appropriation of private rents by insiders in those firms investigated for tax evasion. We also find evidence consistent with a simultaneous spillover effect: the largest non-government controlled companies in Russia decrease income diversion even though they were not explicitly targeted as tax evaders. This effect is significant both economically and statistically after controlling for changes in firm-level corporate governance and it cannot be explained by trends in the general improvement of corporate governance in Russia during our sample period. Finally, we find no significant evidence of either substitution or complementarity between firms' corporate governance and government's tax enforcement vis-à-vis income diversion.

Keywords: tax enforcement, income diversion, corporate governance, spillover

JEL Codes: D73, G30, G38, H11, H26

1. Introduction

In this paper, we want to answer three questions. First, we will investigate whether tax enforcement may be used as an instrument to curb income diversion by managers and/or controlling shareholders. Second, we will analyze whether income diversion decreases simultaneously in other companies not explicitly investigated for tax evasion and, if so, what firm characteristics are associated with this spillover effect. Third, we want to know whether tax enforcement is less effective when the company has stronger corporate governance institutions. In other words, whether tax enforcement and firm corporate governance work as complements or substitutes at the firm level.

The first challenge to answer these questions is how to estimate income diversion. The literature offers three methods to proxy income diversion indirectly by measuring the private benefits of control. The first method, pioneered by Lease, McConnell, and Mikkelson (1983), relies on differences in prices between voting and non-voting shares that have the same or similar dividend rights. The second method, first applied by Barclay and Holderness (1989), is based on differences between the negotiated prices of controlling blocks of publicly traded companies and the market prices of shares. The third method, developed by Bertrand, Mehta, and Mullainathan (2002), focuses on the tunneling of resources from firms where controlling parties have low cash flow rights to firms where controlling parties have high cash flow rights. 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.[1]

The second challenge is how to deal with endogeneity. We use a series of actions started with a memorandum released by the Russian Ministry of Finance after the election of Vladimir Putin in 2000 as an exogenous shock to tax enforcement.[2] This memo explicitly mentioned four large oil companies suspect of tax avoidance: Sibneft, Slavneft, Yukos and TNK. Consistently with the evidence in Desai, Dyck, and Zingales (2007), income diversion as a percentage of revenues is shown to decrease significantly for these companies starting in 2002.

We then investigate whether this shock had any spillover effect on income diversion among other Russian companies and whether this effect is weaker (if substitutes) or stronger (if complements) for firms with better corporate governance. We hypothesize that larger firms should react more promptly to the threat of stricter tax enforcement. 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.

Our sample consists of 156 large Russian firms in 12 different industries in the period 1999 through 2004. We construct five corporate governance variables at the firm level: cross-listing as an ADR in the U.S., being audited by one of the 'Big 5' international accounting firms,[3] and three variables related to the company's board: whether a foreigner serves on the

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[1] Mironov (2013) defines a "spaceman" as a firm that pays either zero or infinitesimal taxes relative to its turnover. We identify 99,925 spacemen in the 1999-2004 period.

[2] See Desai, Dyck, and Zingales (2007) for a detailed description of this series of actions.

[3] Because the sample period starts in 1999, Arthur Andersen was still one of the "Big 5" accounting firms.

company's board, the size of the board and whether the CEO has a seat on the board. These firm-specific variables will allow us to study how different corporate governance mechanisms interact with tax enforcement at the firm level.

We begin by documenting the magnitude of income diversion in our sample. To construct our income diversion metric, we use a unique set of Russian banking transaction data from the 1999-2004 period. Leaked to the public from the Russian Central Bank in 2005, the dataset contains 513 million transactions of 1.7 million firms and covers 75%-80% of all banking transactions that occurred in Russia in 1999-2004. We construct three measures of diversion: net transfers to spacemen as a percentage of total payments; net transfers to spacemen as a percentage of revenue; and net transfers to spacemen as a percentage of assets. We find that income diversion among public firms is sizeable and significant, although smaller in relative terms than the effect documented by Mironov (2013) for private firms. According to our data, a company on average diverts 2.7% of its total payments, 1.8% of its revenue, or 1.7% of its assets per year.[4]

We then investigate what firm characteristics are related to a decrease in income diversion. In annual cross-sectional regressions, we show that the decrease in income diversion from 2001 to 2002 is larger for firms with bigger size. This result is robust after controlling for industry fixed effects and other firm characteristics like firm's leverage, income diversion

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[4] Income diversion likely includes bribes, which, one may argue, may have a positive net present value for the firm's minority shareholders. Obviously, such activities are not reported and, therefore, cannot be controlled by minority shareholders. For example, if a CEO or a major shareholder needs to pay a $100 bribe, there is no control mechanism that prevents him from transferring more than $100 to spacemen. It is likely that the manager will transfer to spacemen as much as he can as long as the marginal benefits of diversion are greater than the marginal costs.

(relative to revenues) in the previous year, or revenue growth. This effect is not significant in any other year of the sample. We interpret this as evidence of a spillover effect on income diversion among larger firms sparked by the memorandum and other tax enforcement actions. The variation in income diversion is unrelated to any corporate governance instrument.

In the panel regressions, we show that the top 10% of Russian firms by market capitalization not controlled by the government reduce their income diversion by about 3% of revenue per year on average, starting in 2002. This result is statistically significant at the 1% level and robust after controlling for changes in corporate governance at the firm level, year, and firm fixed-effects. In contrast, average income diversion keeps increasing after 2001 for large firms controlled by the government and for the rest of (smaller) firms in our sample. Hence, our finding cannot be explained by a general improvement in corporate governance in Russia during the sample years. We interpret this as evidence in favor of our hypothesis of a spillover effect of tax enforcement among the largest public Russian firms.

Finally, our results show only partial support for a negative relation between cross-listing as an ADR in the U.S. and income diversion. Controlling for industry and year fixed-effects, on average, firms with ADRs divert 0.7% less relative to revenues than firms without ADRs. No other governance variable is related to income diversion. After controlling for the spillover effect between 2001 and 2002 and firm fixed-effects, we find no evidence that tax enforcement is less effective for cross-listed firms. In general, we do not find that tax enforcement and corporate governance work either as substitutes or as complements. They are mostly unrelated in our sample.

We contribute to the literature that analyzes the frictions caused by the diversion of corporate resources to private interests (e.g., Shleifer and Vishny, 1997) and the institutions

that may help reduce it. The extant literature has focused on factors such as debt discipline (Jensen and Meckling, 1976), the legal environment (La Porta, Lopez de Silanes, Shleifer, and Vishny, 1998, 2000; Nenova, 2003; Dyck and Zingales, 2004), the level of investor protection (Nenova, 2003; Dyck and Zingales 2004), product market competition (Guadalupe and Perez-González, 2010), and increased public opinion pressure (Dyck and Zingales, 2004).

In this paper, we focus on two institutions: tax enforcement and corporate governance. Desai, Dyck, and Zingales (2007), the closest reference to our paper, introduced the notion of the state as, *de facto*, the largest minority shareholder in almost all corporations. They show that the tax enforcement actions following Putin's election in 2000 are associated with higher market capitalization of Russian oil firms. They interpret the latter as the result of a decrease in income diversion. Our direct measure of income diversion can be applied to all firms across sectors, in contrast with alternative indirect measures based, for instance, on voting premia which would restrict the sample to firms with dual share classes. Thus, extending the analysis of Desai, Dyck, and Zingales (2007), we provide direct evidence that an increase in tax enforcement is associated with lower income diversion not just among oil firms but large public firms in general. Moreover, we do not find support for the hypothesis that corporate governance at the firm level is related to the effect of tax enforcement on income diversion.

We contribute to the literature on income diversion and corporate governance in emerging economies. A close reference to our work is Jiang, Lee, and Yue (2010). These authors document cash flow tunneling among Chinese companies through intercorporate loans between 1996 and 2006. Their sample is larger and their time-span longer. In our case, however, we can use an exogenous shock (Putin's measures after arriving to power in 2000), to draw some conclusions on causality. The authors conclude that only continued public

enforcement was successful to eradicate tunneling. Black (2001) finds a positive correlation between firm value and corporate governance for a reduced sample of 21 Russian firms in 1999. This evidence is extended to a larger set of Russian firms and different governance indices from 1999-2004 by Black, Love, and Rachinski (2006). Overall, their results support a positive link between firm-specific corporate governance and value. Finally, Black, Jang, and Kim (2006) use an instrumental variable approach to test whether better governance predicts higher market value among over 500 Korean companies in 2001.

We also contribute to the literature of spillover effects in law enforcement. Alm, Deskins, and Mckee (2009) study tax compliance in a lab experiment. They find that income reporting is sensitive to information obtained from other subjects. Rinke and Traxler (2011) present field evidence on externalities on compliance with TV license fees. Pomeranz (2013) is more closely related to our paper. Using a randomize experiment, she finds strong evidence of spillover effects in VAT reporting among Chilean firms. We use an exogenous shock, the election of Putin in 2000, to show that the memorandum released by the Russian Ministry of Finance affected income diversion among large non-government controlled firms not explicitly mentioned in the memo. Our results contribute to the debate on the efficacy of tax enforcement on income diversion and its interaction with firm corporate governance in emerging markets.

Finally, our work is related to the literature that studies the decision of firms (many of them in emerging markets) to cross-list in developed, better regulated equity markets (e.g., Karolyi, 1998). Cross-listing has been suggested to work as a "bonding" mechanism to either signal that the company has good corporate governance in place (e.g., Doidge et al., 2004) or as the outcome of managers' optimal tradeoff between their private interests and the market value of their equity share in the company (e.g., Doidge et al, 2009). In the first case, the underlying

assumption is that cross-listing in a developed market is a credible signal against income diversion. In the second case, the assumption is that cross-listing significantly reduces the private benefits that controlling shareholders can extract from the firm they control. We cannot empirically distinguish between these two possible interpretations. Our results show that, although cross-listing in the U.S. is indeed correlated with lower income diversion, this evidence vanishes after accounting for the spillover effects from enhanced tax enforcement. This finding reinforces the notion of higher effectiveness of tax enforcement and its spillover effect over traditional corporate governance institutions in curbing income diversion in emerging markets.

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 used in the analysis. Section 4 presents our empirical results. We present conclusions in Section 5.

2.   Analytical Framework

We borrow the model in Desai, Dyck, and Zingales (2007) to illustrate our tests. Let $0 \leq d \leq 1$ denote the proportion of income that insiders (controlling shareholders and/or managers) divert. Insiders own a fraction λ of the company. Diverting is costly and this cost is represented by the quadratic function,

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

where γ 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 α. Increasing α makes tax evasion more costly. It could be interpreted as a higher likelihood of been caught and fined. This translates into a personal cost 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

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

This equation implies that, given a tax rate t,

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 first test is whether, as predicted by the model, an increase in tax enforcement is associated with lower income diversion. Notice that both "forces," tax enforcement and governance improvement, are predicted to work in the same direction and could be acting simultaneously. Thus, we will also test whether tax enforcement and firm corporate governance are substitutes. Although both implications are derived from the model, they were not explicitly tested for in Desai, Dyck, and Zingales (2007). The direct measure of income diversion from Mironov (2013) allows us to test these predictions.

As an exogenous change in tax enforcement, we use the series of actions implemented by the administration of the newly elected President Putin. His election in March 2000 was followed by a significant and unexpected change of tax regime compared to the one existing under his predecessor's ruling, President Boris Yeltsin. Interestingly, this change in regime did not include any substantial modification of the corporate tax rate. Desai, Dyck, and Zingales (2007) present a detailed chronology of these events. One of the first actions was a

memorandum released by the Russian Ministry of Finance in July 28th, 2000, that identifies 4 large oil extracting companies (Sibneft, Slavneft, Yukos and TNK) suspect of using tax evasion schemes.

Our empirical strategy is the following. We first test, without any controls, whether income diversion falls significantly after 2001 for the 4 firms cited in the tax avoidance memorandum. We then investigate whether the new stance of Putin's administration on tax avoidance had any spillover effect on other Russian firms across time. We hypothesize that, in case of spillover, larger firms should respond 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.

We analyze the change in income diversion across all the firms in our sample and identify the characteristics which were most correlated with a decrease in income diversion in 2001-2002. We control for industry fixed-effects.

We then create a new variable, *Tax enforcement*, that takes value of one in years 2002, 2003 and 2004 if a firm is not controlled by the government and belongs to the top 10% firms by 2001 market capitalization. Otherwise, the variable takes value of zero. We regress income diversion on this variable from years 1999 through 2004. We introduce as controls the firm-specific corporate governance variables, firm size, and leverage and revenue growth. We also include firm and year fixed-effects. In order to test whether corporate governance acts as a complement or substitute to tax enforcement, we interact our *Tax enforcement* variable with each corporate governance variable. We perform a number of robustness tests to confirm our results.

Parallel to the increase in tax enforcement, companies in our sample exhibit, on average, an improvement in some corporate governance institutions. To rule out a general trend in corporate governance driving our results, we will compare this set of large companies with the 4 firms included in the memorandum, large government-controlled firms and with the rest of firms in the sample.

Before presenting our tests and results we briefly describe the direct measure of income diversion in Mironov (2013). We then define the firm-level governance variables. Finally, we define a set of control variables.

2.1   Income Diversion Using Spacemen

To illustrate the method,[5] consider the following example. Firm A wants to divert $X of income. It therefore makes a deal with firm B whereby firm B renders to firm A goods or services worth $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 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. As a consequence, several of the company's performance and financial ratios, including its Interest Coverage Ratio, are negatively affected. Second, cash is removed from the company. This immediately reduces the market value of equity and jeopardizes the firm's ability to grow in the future. This affects the firm's market value directly.

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

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[5] For a full description of the method we refer the reader to Mironov (2013).

bank officials. Mironov (2013) identifies 42,483 spacemen and estimates income diversion to be as large as 11.4%–13.1% of Russia's GDP during the 2003–2004 period.

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 (SST) 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, SST, 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 1999-2004.

Next, income diversion at the company level is calculated as the sum of net transfers to spacemen by all company affiliates. In most cases, large Russian corporations do not send funds directly to spacemen but use affiliated entities that, in turn, interact with spacemen. Consider Gazprom, a company that used its affiliates, Gaztaged, Laingaz, and Provaidgaz (100% subsidiaries of Gazprom), and other entities for these purposes. For instance, in 2003-2004, Gaztaged sent $992M to the spaceman Trubniy Torgoviy Dom, and Laingaz transferred $267M to the spaceman Energosintez-M. Hence, in calculating the diversion of large Russian corporations, we aggregate net transfers to spacemen of a main firm and all its affiliates.[6]

This approach to the measurement of diversion does not capture all private benefits of control. For example, it does not capture diversion related to transfer pricing, which Desai, Dyck, and Zingales (2007) document to be enormous in Russia. It does not capture diversion

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[6] Affiliate firms are firms in which the main company has at least a 20% ownership stake. Replacing the 20% with a 50% threshold does not affect the results.

via consumption of perks either (e.g., a private jet plane, membership to an exclusive club, privileged retirement plan or health insurance). Our measures of cash flow diversion, therefore, may significantly underestimate the total private benefits enjoyed by managers and/or controlling parties.

2.2   Corporate Governance Variables

We analyze the following firm-specific corporate governance variables.

2.2.1   Cross-listing

Several papers in the literature (see Doidge, Karolyi, and Stulz (2004) for an extensive review of references) argue that cross-listing in a more developed and more tightly regulated exchange increases firm value, among other reasons, through more efficient monitoring of management. In that case, we may argue, cross-listing decreases income diversion. The argument, however, may also run in the opposite direction. Doidge, Karolyi, and Stulz (2004) associate cross-listing with the private benefits of insiders. By listing in the U.S., the argument goes, a foreign firm from a country with poorer corporate governance standards increases the rights of its investors, especially of its minority shareholders, and constrains the majority shareholder in his ability to extract private benefits from control. According to this model, managers and/or controlling shareholders who decide to cross-list in the U.S. willingly transfer (totally or partially) their private benefits to minority shareholders, decreasing income diversion.

We therefore expect lower income diversion for firms cross-listed in the U.S., although we cannot identify in which direction the causality runs.

2.2.2 Auditing

An important role of auditors is to certify and analyze companies' financial statements. It is commonly believed that auditors should protect shareholders from management fraud. By diverting income, management harms the interests of shareholders in two ways. First, such practices divert current cash flow that would otherwise be available to shareholders. Second, they decrease future expected cash flow by making the company liable for tax evasion associated with income diversion activities - if the government discovers and proves the existence of income diversion schemes, then the company may have to pay all evaded taxes plus penalties. Because auditors have full access to a firm's detailed financial information, including contracts, invoices, payments, and business correspondence, an audit may be a powerful tool for restricting cash flow diversion and protecting the interests of minority shareholders.

As with cross-listing, the causality may also work in the reverse direction. In a signaling model of incomplete information, choosing a prestigious, internationally reputed auditor signals lower income diversion and better governance practices. Moreover, top accounting firms, worried about their reputation, may avoid providing services to firms where they know there are accounting weaknesses and more widespread use of spacemen.

Regardless of the direction in which the causality runs, we expect lower income diversion in companies audited by internationally reputed accounting firms.

2.2.3 Foreigner serves on board

The institution of independent directors is an important instrument of corporate governance. Many corporations, mainly in developing markets, invite reputable foreigners to serve on their boards. Arguably, these directors are less subject to agency conflicts and, hence, should be more efficient in monitoring company CEOs. Additionally, the increasing direct foreign ownership of Russian companies during the sample years may be reflected in more foreign directors appointed. The evidence shows that ties to foreign capital and labor positively affect the transparency in earnings reporting of Russian firms (Braguinsky and Mityakov, 2013).

On the other hand, foreign board members may fit in the "managerial quality hypothesis" of Byrd and Hickman (1992), whereby CEOs of companies characterized by high income diversion "dress up" their firms' boards with independent directors to please shareholders through the illusion of active monitoring, implying a positive relationship between foreign CEOs and income diversion. Finally, we must mention that, as with most governance variables, board composition (including independent directors) is an endogenous variable (e.g., Hermalin and Weisbach, 2003; Harris and Raviv, 2008). This complicates any inference on causality.

We conclude that the relationship between the presence of foreign directors on company boards and income diversion is, ex-ante, unclear. The net effect is, therefore, an empirical question.

2.2.4 Board size

Empirical research has documented that board size and the number of board meetings may be related to firm performance. The evidence on the role of board size is inconclusive. As

noted by John and Senbet (1998), while a board's capacity for monitoring increases as more directors are added, the benefit may be outweighed by the incremental cost of poorer communication and decision-making associated with larger groups. Such a viewpoint was introduced by Lipton and Lorsch (1992), endorsed by Jensen (1993) and tested, on a set of U.S. firms, by Yermack (1996), who finds strong evidence of a negative relationship between firm value and board size. Eisenberg et al. (1998) find similar results. On the contrary, other studies (see, for instance, Dalton et al., 1999), document a positive and significant relation between board size and financial performance.

Given these conflicting results, we remain agnostic about the relation between board size and income diversion.

2.2.5 CEO on board

The extent to which boards are truly independent of CEOs is key to the credibility of the monitoring role of board members and the limitation of agency conflicts. We include a dummy variable that takes a value of one if the CEO serves on the board and zero otherwise.

We expect more active monitoring and, consequently, lower income diversion in those firms where the CEO does not serve on the board.

2.2.6 CEO ownership

One well-studied mechanism that alleviates agency problems is managerial ownership. In their seminal paper, Jensen and Meckling (1976) argue that "as the manager's ownership claim falls, his incentive to devote significant effort to creative activities such as searching out new profitable ventures falls."

We expect then that as CEO ownership increases, the alignment of interests between the CEO and shareholders should increase as well. This should be related to lower income diversion.

The literature has studied other corporate variables. They include the threat of dismissal measured by CEO turnover, ownership concentration and shareholder activism (e.g., Dyck, Volchkova and Zingales, 2008). Unfortunately, our data limitation does not allow us to construct these variables.

2.3 Control variables

Together with the aforementioned governance variables, we include a number of controls also present in previous studies (see, for instance, Doidge et al., 2009). In particular, we include the following control variables:

2.3.1 Government ownership

Direct ownership of a large stake in a company should further increase the incentives of government to decrease cash flow diversion because a reduction in income diversion leads not only to higher tax collections but also higher returns on equities owned by the government. On the other hand, the government is subject to the same principle-agent conflict (e.g., Jensen and Meckling, 1976; Shleifer and Wolfenzon, 2002) as corporations. Moreover, this conflict is even more severe in the case of government ownership because the incentives of officials who act on behalf of the government often conflict with the true interests of the government.

Therefore, in the case of government ownership, two forces act in opposing directions. How government ownership affects cash flow diversion is thus an empirical question.

2.3.2 *Revenue* and *Revenue growth*

Arguably, larger firms (measured in our case by *Revenue*) may enjoy economies of scale that make the implementation of corporate governance controls less onerous and, hence, more likely. Moreover, certain variables such as *Board size* are positively related to the company's size.

Shleifer and Wolfenzon (2002) and Durnev and Kim (2005) predict that controlling shareholders will be less prone to divert resources when growth opportunities are higher because the opportunity cost of the money diverted is higher. Higher growth also increases the likelihood of cross-listing (Pagano, Roell and Zechner, 2002).

Thus, we expect larger revenues and higher revenue growth to be associated with lower income diversion.

2.3.3 Leverage (Debt/Assets)

The optimal capital structure of a company is the outcome of several factors. It is then difficult to argue that leverage is, *per se*, a governance variable. Having said that, to the extent that "debt discipline" (e.g., Jensen and Meckling, 1976) increases the monitoring of insiders by creditors, we should expect lower income diversion in more leveraged firms.

2.3.4 Industry

Industry might be an important factor which drives the choice of corporate governance structure. Thus, we control for industry fixed-effects in our cross-section specification.

3.   Data and Sample

The main data source used in this paper is a unique dataset of Russian banking transactions from 1999 to 2004. The data for 2003 and 2004 were used in Mironov (2013) and come from www.vivedata.com. The data from 1999 to 2002 were obtained through www.rusbd.com. The dataset contains information on 513,169,660 transactions involving 1,721,914 business and legal government entities and self-employed entrepreneurs without legal enterprise status, including 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.

All the data is hand collected. To construct a sample of companies, we start with 347 corporations that were traded on the RTS (Russian Trading System) at the beginning of 2006. These companies are selected because the Federal Financial Market Service (FFMS) requires that traded companies regularly submit yearly reports containing, among other items, information on board composition and the company's auditor. Moreover, the regulator requires that when companies go public, they disclose data from previous years. We will use this requirement to collect data from all companies not listed by 2004 (the final year of our sample) but which were listed by 2006. We collected governance data primarily from company reports. Not all companies listed in 2006 kept in their web-sites yearly reports for previous years. Many companies went public in 2005 and 2006 (Table 1A shows the increasing trend in listing). Therefore, we could not collect the data for 1999-2004 for many of them. Some companies

which were listed before 2004 did not store the yearly reports for previous years. Finally, because large Russian companies typically divert cash flow through affiliate entities, we restrict the sample to companies that have lists of affiliates available for 2003 or 2004.[7] After applying these filters, our final sample decreased from 347 to 156 companies.

Using information from quarterly reports submitted to the FFMS, we manually code the following variables related to corporate governance. *ADR* is a variable that takes a value of one if a company has ADRs (American Depositary Receipts) and zero otherwise.[8] *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 ownership* indicates a CEO's company stock ownership as a percentage of total market capitalization. *CEO on board* and *Foreigner on board* are variables that take values of one if, respectively, the CEO has a seat on the board or a foreigner serves on the board, and zero otherwise.

We supplement these data with data from Rosstat, the Russian statistical agency, accessible at spark.interfax.ru. This database contains each firm's INN (taxpayer number), name, and region, date of registration, industry, and additional identifying information about the firm. In addition, it contains basic accounting data, such as revenue, profit, net income, assets, debt, and other items. According to Russian law, all firms (even small ones) must report

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[7] When data was collected in 2006, data on affiliates prior to 2003 were, in many cases, not available. We assume that affiliate companies in 2003 were also affiliates during 1999-2002.

[8] Our data do not distinguish between Level 1 ADRs, which trade Over-The-Counter, and Level 2 and 3 ADRs, which are directly listed in 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 in the London Stock Exchange. These companies were also listed in the New York Stock Exchange.

their balance sheets and income statements to Rosstat on a quarterly basis. Although the law does not explicitly penalize firms that do not report, the majority of Russian firms prefer to report their data to Rosstat to maintain good relations with the tax authorities. Rosstat contains accounting data for approximately 2.5 million Russian firms.

We use these data to construct our control variables. Log(*Revenue*) is the natural logarithm of the company's reported revenue. *Revenue growth* is defined as Log($Revenue_{t+1}$) − Log($Revenue_t$). *Owned by government* is a variable that takes a value of one if the government owns more than 20% of company shares and zero otherwise (a threshold of 50% yields similar results). *Debt/Assets* is the ratio of the company's long term debt over total asset value, both at book value. The control variables *Revenue growth* and *Debt/Assets* are winsorized at the top 95%.[9] Since we have only 156 companies, we assign *industry dummies* according to Fama French 12 industry classification criteria.

Table 1, Panel A presents summary statistics for all firms in our sample. An average (median) company has revenue of 683M (143M) dollars and assets of 1,287M (174M) dollars.[10] Of the companies, 64.2% were traded on RTS or MICEX in 1999-2004, and 7.3% were cross-listed on U.S. exchanges. Additionally, 18.2% were audited by a Big 5 accounting firm. The average board has 8.4 members (the median is 8). CEO ownership is very low, with an average of 1.6% and a median that is not distinguishable from zero (in comparison, U.S. directors and officers holdings in Yermack's (1996) sample account for, on average, 9.1% of company market capitalization, with a median of 2.8%). Given that CEO ownership is nearly zero for the majority of firms in our sample, we remove this variable in later tests. In more than 83% of cases, the CEO serves on the board of directors, and 14.6% of companies include at

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[9] The results are qualitatively the same when the winsorization is performed at the top 99%.
[10] The exchange rate is updated annually. The average rate over the sample period was 30 Rubles per Dollar.

least one foreigner on the board. The government controls 27.7% of the companies in the sample. The average leverage (*Debt/Assets*) is 16.5%; the median is 11.7%.

Panel B of Table 1 reports summary statistics for the subsample of companies with ADRs, which are much larger than most companies in the sample. An average (median) company that is cross-listed on the U.S. stock exchange has revenues of 4,235M (1,072M) dollars and assets of 9,199M (1,779M) dollars. A much larger percentage (62.2%) of these companies are audited by Big 5 accounting firms and are more likely (35.6%) to have a foreigner sitting on the board and be controlled by the government (40%). The average cross-listed company has a higher Tobin's *Q* value[11] equal to 1.168. Their operating performance is also higher. The average *EBITDA Margin (EBITDA/Revenue)* for companies with ADRs is 28.6% compared to the average *Margin* for all companies in the sample which is 16.6%.

Panel C of Table 1 shows the annual average value of each variable from 1999 through 2004. Notice that the average firm becomes steadily larger over time, both measured by revenues and assets. It is worth mentioning that some governance and control variables experienced a sharp increase starting in year 2002. In particular, the average number of firms cross-listing in the U.S. as an ADR increased from about 6.5% of the companies in the sample in 2001 to almost 9% in 2002-2004. The average number of foreign board members jumps from 12.9% in 2001 to 18% in 2002. Simultaneously, the average number of firms controlled by the government in our sample gradually fell from above 30% in 2001 to 22% in 2004.

Finally, Panel D of Table 1 presents the correlations among corporate governance variables. As expected, having one of the Big 5 accounting companies as an auditor is more

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[11] We calculate Tobin's *Q* for listed companies as follows. For the numerator, we take total assets, subtract the book value of equity, and add the market value of equity. For the denominator, we use total assets.

prevalent among firms cross-listed in the U.S. These companies tend to have larger boards as well.

[Insert Table 1 here]

4.   Empirical Results

4.1   Measuring Income Diversion

For the total sample of 156 companies, we find more than 7,000 affiliates in the 1999-2004 period. 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.

Note that not all monies transferred to spacemen constitute cash flow diversion. If a firm pays a spaceman for non-existent 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. To illustrate, consider a manager who wishes to divert cash by buying a computer above fair price. He 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 money transferred to a spaceman and money the spaceman transfers to regular firms.

We identify 99,925 spacemen in the period 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

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total value of $1.6 million. 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.

Table 2, Panel A presents summary statistics of the income diversion measures. To reduce the influence of outliers and measurement error, the measures of income diversion are winsorized at the top 95th percentile. Annually, an average firm transfers to spacemen 2.7% of its total payments, 1.7% of its book assets, and 1.8% of its revenues. Cross-listed companies with ADRs (panel B) transfer to spacemen an even smaller percentage: 1.8% of their payments, 0.9% of their assets, and 1.3% of their revenues.[12]

[Insert Table 2 here]

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[12] Table A1 in the Appendix reproduces Table 2 using gross transfers instead of net transfers to spacemen. The pattern is very similar although the figures are slightly larger.

Table 3 shows the top 20 largest companies by income diversion. Comparing Table 3 with the median diversion values shown in Table 2, we observe that income diversion is highly skewed by a subset of large companies engaged in massive diversion, both in absolute and relative terms.

The largest diverter is Lukoil, one of the world's largest oil producers, with $7.5 billion dollars accumulated from 1999 to 2004, followed by Gazprom, the largest Russian company, with $2.2 billion dollars. Interestingly, consistent with the findings of Desai, Dyck, and Zingales (2007) for Sibneft, Lukoil significantly decreased its transfers to spacemen starting in 2002, after Putin started a series of actions to enforce tax payment by top oil companies in Russia. The sharp decline in income diversion reported in Table 3 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. In the same period, income diversion, net transfers and *ShadowR* more than doubled for Tatneft, a relatively smaller oil company in Tatarstan that was not affected by Putin's enforcement action. 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 in the 2003-2004 period. In the next section we will present empirical evidence in our sample showing how Putin's tax enforcement measures curbed income diversion in large non government-controlled firms without affecting smaller firms and government owned firms.

[Insert Table 3 here]

4.2   Income Diversion and Tax Enforcement

We analyze in this section the effect of the increase in tax enforcement following the election of Vladimir Putin in 2000 on firms' income diversion. Table 4 shows the evolution in income diversion for the 4 oil-extracting firms included in the tax avoidance memorandum issued by the Ministry of Finance in July 2000: Sibneft, Slavneft, Yukos and TNK.

The evidence reported in Table 4 suggests two things. First, until 2001 income diversion was increasing for all these companies virtually every year. Second, the increase in tax enforcement had a sizeable impact on income diversion for those firms explicitly mentioned in the memorandum. Even though tax enforcement actions were undertaken in the second half of 2000 and the beginning of 2001, it typically takes some time for the companies to change their business processes. From 2001 to 2002, *ShadowR* decreases between 24% in the case of Slavneft and 55% in the case of TNK. This is consistent with the model's first testable implication as well as with the indirect evidence presented in Desai, Dyck, and Zingales (2007). We cannot discard, however, that these results are actually driven by a concurrent improvement in corporate governance in these specific firms. Unfortunately, due to data limitations, we could not find information on corporate governance variables for all the four companies.

[Insert Table 4 here]

4.3   Evidence of spillover effects

In this section we test whether the decrease in income diversion after 2001 reported in the previous section for the four firms explicitly mentioned in the memorandum extended to other Russian firms. If so, we want to investigate what company features may explain the

spillover effect and whether it was mitigated by better corporate governance as predicted by the model.

For each firm in our sample, we define the change in income diversion in year 2000 as the difference between ShadowR in year 2000 and *ShadowR* in year 1999. We then regress these changes against *ShadowR*, *Log(Revenue)*, *Revenue growth*, *Owned by government* and *Debt/Assets*, all of them as of 1999. The regression also includes industry fixed-effects. We repeat this process for years 2001 through 2004. The OLS cross-sectional estimates are reported in Panel A of Table 5. Notice that every year the number of firms increases since there are new firms that go public and/or satisfy the data requirements.

Each year, *ShadowR* at the beginning of the year is negative and strongly related to the variation in income diversion over the year. This is consistent with mean reversion in income diversion over time among Russian firms. Among the firm characteristics included in the regressions, firm size is the only variable statistically significant at the 5% and only in year 2002. That is, larger firms decreased income diversion significantly more in year 2002, exactly the same year as the four firms included in the memorandum issued by the Russian Ministry of Finance as shown in Table 4. Notice that company size is significant after controlling for the level of income diversion and industry fixed-effects. In Panel B, we repeat the same test controlling for the corporate governance variables. The coefficient on *Log(Revenue)* is virtually the same and it remains statistically significant at the 10% in year 2002.

Panel C of Table 5 presents the full regression in year 2002. In specifications (1) through (5) we control for each corporate governance variable at a time. All specifications include industry fixed-effects. In specification (6) we include all governance variables simultaneously. The coefficient on *ShadowR* is negative and significant at the 1% in all

specifications. Likewise, the coefficient on company size, proxied by *Log(Revenue),* is negative and significant at the 5% (10% in specification (6)). Notice as well that the size of the coefficient is virtually the same across all specifications, around 0.18%.

[Insert Table 5 here]

We next explore the panel data. We construct a new variable, *Tax enforcement,* that takes a value of one in years 2002, 2003, and 2004 if the company is among the top 10% largest market capitalization companies in 2001 and it is not controlled by the government; otherwise*,* the variable takes a value of zero. Six companies meet this double criteria: Lukoil, Severstal (the largest steel producer in the country), Yukos, MTS (Russia's largest mobile network provider), Norlisk Nickel (the world largest nickel producer) and Surgutneftegas (one of the largest oil companies in Russia). These companies represent, together, 90% of total market capitalization of all companies not controlled by the government in 2001. We exclude companies controlled by the government since, arguably, it is not necessary to take any public tax enforcement action against these companies. There is evidence that managers of government-controlled companies are indirect subordinates of President Vladimir Putin and that he appoints them. For instance, Alexei Miller, a close friend of Vladimir Putin, was appointed as CEO of Gazprom the year after Putin was elected President. Table 6 presents the evolution of our measure of income diversion for these corporations from 1999 (when available) through 2004. Every year we report the value of *ShadowR* for each firm. Notice that, in all cases, income diversion increased until (and including) 2001. The decline in *ShadowR* from 2002 onwards is, in most cases, very dramatic. In the case of Lukoil, the decline in 2002

is more than half and it keeps declining every year. For Severstal, the decline in 2002 is about a third, although it grows back thereafter. In the case of Norilsk Nickel, *ShadowR* declines more than 60% from 2001 to 2002.

[Insert Table 6 here]

In column (1) of Panel A in Table 7 we report the results of the regression of income diversion, represented by the variable *ShadowR*, on *Tax enforcement*. We include the control variables defined in Section 2.3. The results of the table indicate that the tightening of tax enforcement resulted in a significant decrease in income diversion for large Russian corporations starting in year 2002. This result is robust to the inclusion of year and firm fixed-effects. On average, large non-government-controlled firms decreased income diversion by 2.8% of sales from 2002 on relative to their previous value in 2001. This decrease is economically large relative to the average *ShadowR*, 1.8% of revenue, reported in Table 2. It is statistically significant at the 5%. This means that the companies presumably targeted by Putin's Administration evaded much more than the average company in the sample before the tax enforcement actions.[13]

We then include in column (2) all the corporate governance variables described in Section 2.2. The coefficient remains virtually the same (2.92%) and becomes significant at the 1%. Contrary to the model's prediction (i.e., better governance is associated to lower income diversion), none of the governance variables is related to income diversion. This confirms the cross-section results in Table 5. We want to explore next whether, as predicted by the model,

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[13] Table A2 in the Appendix replicates Table 7 using gross transfers instead of net transfers to spacemen. After defining *Gross ShadowR=Gross transfers to spacemen/Revenue*, we find that, on average, large non-government-controlled firms decreased income diversion by 3.7% of sales from 2002 on relative to their previous value in 2001. These result is very robust after controlling for corporate governance in different specifications of the test.

corporate governance works as a substitute to tax enforcement. If that is the case, provided that better governance is associated with lower income diversion (lower *ShadowR*), the interaction term between *Tax enforcement* and, respectively, *ADR*, *Audit by Big 5*, and *Foreigner serves on board* should be positive: the spillover effect of tax enforcement (stronger among larger non-government controlled firms) should be less pronounced among firms with better corporate governance. On the other side, the interaction term between *Tax enforcement* and *CEO on board* should be negative: firms whose CEO seat on the board have weaker corporate governance and, hence, profit more from the spillover effect of more strict tax enforcement. Since we do not have any clear prediction on the effect of *Board size* on income diversion, we can only predict that the sign of the corresponding interaction term should be the opposite to the sign on *Board size*. We perform this tests in specifications (3) through (7) in Table 6. In each specification we introduce the *Tax enforcement* variable, a corporate governance variable and the product of both variables. We include the control variables, year and firm fixed effects. In all specifications except in (6) the coefficient on *Tax enforcement* remains negative and significant at the 5%. Only the interaction between *CEO on board* and *Tax enforcement* – specification (7)- is statistically significant and negative.

[Insert Table 7 here]

4.4 Interpretation

The evidence reported in Tables 5 to 7 is consistent with a spillover effect from the tax enforcement measures adopted by Putin's administration after his election in 2000. Although the memorandum issued by the Ministry of Finance only mentioned four Russian oil

companies, income diversion decreased significantly among other large, non-government controlled companies in different sectors. There are three conclusions from the evidence reported in these tables. First, company size (proxied by revenues) is a key factor explaining the reach and magnitude of the spillover effect. Second, firm's corporate governance has no discernible relation with income diversion. Third, we could not find evidence in support of substitution or complementarity between tax enforcement and corporate governance.

Regarding the first conclusion, why may company size be related to spillover effects of tax enforcement on income diversion? With hindsight, one possible interpretation is that larger firms non-controlled by the government were targeted by Putin to leverage his power among Russian oligarchs and, ultimately, derive private benefits. This interpretation is consistent with the fate of Yukos. In October 2003, Khodorkovsky -CEO of Yukos- was arrested. From 2003-04 onwards, 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.

There is, however, evidence that conflicts with this hypothesis. First, several of the CEOs from the companies that exhibited a more drastic decrease in income diversion after 2001 were publicly known to be in good terms with Putin like Sibneft and Lukoil. Desai, Dyck, and Zingales (2007) also show that the investors positively evaluated Putin's action: the market price of Sibneft and other oil and gas companies raised significantly 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 years 2002, 2003, and 2004, respectively. Although these facts do not prove anything by themselves, they show that foreign and local investors positively reacted on Putin's new policies.

An alternative explanation would be that the Russian authorities had limited resources and, thus, targeted the largest firms first since they were, in absolute value, the biggest income diverters. These firms, we hypothesize, felt an imminent threat after the public release of the memorandum and, in spite of not being explicitly targeted by the Ministry of Finance, reacted simultaneously to the four firms in the memo reducing their income diversion. Although we cannot test this hypothesis directly, Table 3 shows some indirect support for this intuition: four out of the six largest firms non-controlled by the government in our sample (*Tax enforcement=1*) are also the largest absolute diverters measured by their aggregate dollar diversion from 1999-2001 (*Lukoil*, *Norilsk Nickel*, *Severstal*, and *Yukos*). There is anecdotal evidence that following 2004, smaller firms non-controlled by the government started reducing their income diversion. This is consistent with a gradual spillover effect of tax enforcement measures costly to monitor and implement that began, explicitly, with the four oil firms included in the 2000 memorandum.

The reported evidence on the decrease in income diversion after the tax enforcement measures suggests that minority shareholders should profit from this policy. Our banking transactions data, however, do not identify the final recipients of the cash dispensed from the spacemen accounts. Therefore, we cannot distinguish between tax evasion and expropriation of minority investors. One way to analyze this would be to study the evolution in payout among the set of large, non-government controlled firms relative to the rest of firms in the sample. Unfortunately, payout data in those years is very incomplete. Incidentally, among the set of large firms in Table 6, we observe very dramatic increases in cash dividends around implementation of stricter tax enforcement: *Lukoil*, for instance, increases cash dividends by 483% in 2001 and 285% in 2002; *Norilsk Nickel* by 591% and 1508% in 2001 and 2002,

respectively; *Surgutneftegas* increased cash dividends by 148% in 2001 although it reduced them by 3% in 2002. This evidence is consistent with a value redistribution towards minority shareholders following the reduction in income diversion.

We analyze now the relation of income diversion with different corporate governance variables and the interaction between the later and tax enforcement. In Tables 5 and 7 we find no evidence of any relation between income diversion and any of the corporate governance institutions that we analyze. This is true when we analyze both the cross-sectional variation in income diversion year by year (Table 5) and the relation between *ShadowR* and, simultaneously, all the governance variables in the panel data (specification (2) in Table 7). When we analyze the interaction between *Tax enforcement* and each corporate governance variable (specifications (3) through (7) in Table 7), the result is virtually identical. No governance variable, when considered individually, is related to *ShadowR*. As for the interaction terms, only *CEO on board* (specification (7)) shows a significant coefficient consistent with the model prediction: larger firms non controlled by the government (exposed to a stronger spillover effect) whose CEO seats on the board (hence reflecting weaker corporate governance) experience a significant decrease in *ShadowR*.

The lack of significance of the corporate governance variables might be caused by little within-firm variation across these variables: if a firm cross-lists as ADR in a given year then it will be, most likely, cross-listed the following year; likewise, if a firm is audited by a Big 5 accounting firm then it will be, most likely, audited by a Big 5 firm the following year. To rule out this possibility we employ cross-section regressions controlling for industry dummies to eliminate possible variation in industry-specific corporate governance.

In particular, we run multivariate panel regressions of the diversion measure, *ShadowR,* on the various corporate governance characteristics controlling for firm size, government ownership and leverage. We introduce year and industry dummies. Standard errors are clustered at the firm level. The results are reported in Table 8.

When we consider cross-listing in the U.S. in specification (1), the coefficient on the variable *ADR* is negative 0.68%, significant at the 10% level. In specification (7), where all variables are considered jointly, the coefficient rises to negative 0.77%, and it becomes significant at the 5% level. This negative coefficient may be interpreted as evidence of a causal effect of cross-listing, which imposes stricter corporate governance standards on the company, hence curbing the ability of insiders to extract private rents. Alternatively, cross-listing in the U.S. may be a signal used by companies that already have a good corporate governance system in place and, in particular, exhibit low income diversion. Either way, our results show that companies cross-traded in more developed stock markets tend to divert less income.

Audit by Big 5 is not significantly correlated with income diversion. This finding may suggest that Enron was most likely not an exception, as auditing by a reputable firm does not protect shareholders from managerial fraud.[14]

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[14] As anecdotal evidence on this point, in 2003-2004, Gaztaged (a 100% subsidiary of Gazprom) transferred one billion dollars to an unknown company, Trubniy Torgoviy Dom. According to Spark (Spark.interfax.ru), this company was registered in December 2003 with a charter capital investment of 10,000 RUR ($330). Banking data show that the new company received $343,000,000 from Gazprom in 2003 and $657,000,000 in 2004 in payment for pipes. According to Rosstat data, revenues of Trubniy Torgoviy Dom were $148,000 in 2003 and $206,000 in 2004, or approximately 3,000 times less than actual revenues. In addition, this firm has no website or office. Based on this evidence, we conclude that this company is a typical spaceman and that the billion dollars transferred to it was pure cash flow diversion. There is no mention whatever of this transfer or the alleged supplier in PWC's audit opinion for Gazprom. We can only speculate whether this was due to incompetence or bribery.

All the variables related to the board and its composition (*Foreigner on board,* Log*(Board size),* and *CEO on board*) are uncorrelated with income diversion.

[Insert Table 8 here]

Regarding the controls, *Revenue growth* is negatively related to income diversion, although this effect is only marginally significant at the 10% level. This is consistent with the evidence reported by Shleifer and Wolfenzon (2002) and Durnev and Kim (2005). *Owned by government* is not significantly related to income diversion. This may be the net outcome of the two opposing effects discussed in section 2.3. Firm size, proxied by *Log(Revenue)*, is unrelated to income diversion. Finally, firm leverage, proxied by *Debt/Assets*, is positively and significantly related to income diversion at the 1%. This result is in contradiction with the expected negative relation we hypothesized based on the standard "discipline effect" of debt (Jensen and Meckling, 1976). This finding may reflect that firms with higher income diversion cannot finance themselves so easily in the equity market. On the other side, banks, or lenders in general, are more protected than shareholders because they can seize firm assets in case of default. Mironov and Srinivasan (2013) find that debt holders also protect their interests by charging higher interest rates to firms with high levels of income diversion. Hence, the cross-sectional test confirm the evidence reported in tables 5 and 7. Corporate governance is, at least in our sample, largely unrelated to income diversion.

4.5 Robustness test

As a robustness test, we redefine the *Tax enforcement* variable to take value 1 for the 5% (Table 9) non-government controlled firms in the sample. The sample of firms satisfying this threshold shrinks to three firms. The coefficient on *Tax enforcement* remains virtually unchanged relative to the 10% threshold and significant at the 10%. When we define the threshold as the 25% largest firms (Table 10) the coefficient is negative and significant at the 1%. The coefficient halves from 2.9% to 1.6%. This indicates that the spillover effect from the memorandum on income diversion is concentrated on the largest firms In this case the number of firms that take value 1 for this variable grows to 14 companies.

Althought the coefficients in Table 9 on the interaction between *Tax enforcement* and, respectively, *Audit by big 5*, *Foreigner serves on board*, and *Log(Board size)* are significant, the result is not present in Table 7 and Table 10 when we consider a larger sample of affected companies. Thus, the results in Table 9 are most likely caused by one or two outliers with this specific corporate governance characteristics. Hence, comparing tables 7, 9, and 10, the only evidence that remains robust regardless of the threshold used to define the variable *Tax enforcement* is that this variable carries a negative and significant coefficient with respect to *ShadowR*, the income diversion measure. The evidence on the interaction between tax enforcement and the governance variables is not robust and, certainly, does not support the substitution hypothesis predicted by the model.

[Insert Table 9 here]

[Insert Table 10 here]

To further disentangle the effect of firm size on our results, we carry out two sets of quantile regressions. In Table 11, Panel A, we create four tax enforcement dummies that take value 1 after 2001 if the firm is private and belongs, respectively, to the first quartile (largest firms by 2001 market capitalization) down to the fourth quartile (smallest firms); the dummy variables take value zero otherwise. We repeat the same procedure for government-controlled firms. We then run the panel regressions controlling for *Debt/Assets*, *Log(Revenue)*, *Revenue growth*, and the corporate governance variables. We also include year and firm fixed effects. In the first column, where we consider only the set of private firms, we observe that the top quartile (largest firms) carries a negative and significant coefficient. The rest of coefficients on quartiles with smaller firms are non-significantly different from zero. When we perform the same test for government-controlled firms in the second column we find that, almost symmetrically, only the third quartile (smaller firms) carries a significant (negative) coefficient, albeit much smaller in absolute terms than the coefficient on the first decile of private firms. These results remain virtually the same when we include, simultaneously, all the firms, public and private, in the third column.

In Table 11, Panel B, we repeat the same type of exercise but dividing firms, both private and controlled by the government, into ten deciles according to 2001 market capitalization. The results are, qualitatively, analogous: only the top decile among private firms and the seventh decile among government-owned firms carry a negative and significant coefficient on the corresponding dummy. These results confirm that the new, stronger stance on tax enforcement taken by Putin after his arrival to power had a distinctive effect on income diversion among large firms non-controlled by the government.

[Insert Table 11]

Finally, it is possible that the decrease in income diversion was caused by a general trend in corporate governance improvement not captured by firm-specific governance variables. Supporting this alternative explanation, Panel C in Table 1 shows that some corporate governance and control variables (notably, *ADR*, *Foreigner on board*, and *Owned by government*) experienced, on average, significant changes starting in 2002. Thus, we have more firms with "good governance" in the second half of our sample period. To address this concern, Figure 1 shows that the pattern of income diversion after 2001 is very different for the subsample of large publicly listed companies relative to large companies owned by the government which includes Tatneft (oil company), Mosenergo (Moscow electricity distribution monopolist), and the gas-giant Gazprom. We also compare it to the rest of companies in our sample. Notice that income diversion across government owned companies as well as the rest of companies in our sample keeps increasing after 2001. We interpret this as evidence that the results reported in tables 5 through 7 are not a consequence of an improvement in the general level of corporate governance in Russia during the sample period. Figure 1 also shows that the pattern in income diversion experienced by the four companies explicitly mentioned in the memorandum is very similar to the pattern displayed by the six largest firms by market capitalization non-controlled by the government in our sample. This lends support to our assumption that the increase in tax enforcement affected large companies non-controlled by the government, whether included in the memorandum or not.

[Insert Figure 1 here]

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5.   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) to directly estimate income diversion among public firms in Russia. We have used these estimates to study the effect of an exogenous shock to 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 1.8% of company revenues or 1.7% of assets 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 as suspect of tax avoidance showed a drastic decrease in income diversion after 2001. A set of 6 large firms non-controlled by the government also experienced a similar decline in income diversion after 2001. Moreover, we have shown that the drop in income diversion for this set of firms is robust after controlling for firm-level corporate governance, firm leverage, size and growth in revenues, year and firm fixed-effects. The (decreasing) trend in income diversion shown, on average, by these firms after 2001 is in sharp contrast with the average increasing trend displayed by large firms controlled by the government and the rest of (smaller) firms in our sample. Altogether, we interpret this evidence as empirical support for the role of tax enforcement as a powerful mechanism to curb income diversion in emerging markets.

Analyzing the interaction of corporate governance mechanisms and income diversion we have found no significant evidence of either an impact of corporate governance on income diversion or a substitution between tax enforcement and corporate governance.

These results cast doubt on the efficacy of corporate governance mechanisms typically used in advanced economies to limit income diversion in emerging economies. The government, as a stakeholder in the company may, via tax enforcement, have a larger impact on income diversion than the conventional governance institutions. This impact has positive externalities on the reduction of income diversion among other large firms not explicitly targeted by the tax authorities.

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Table 1

Summary Statistics: Sample of Companies

The table presents summary statistics for the sample of 156 companies. In Panels A and B, all statistics are averaged for 1999 to 2004. Panel C includes average values per year. Panel D presents the correlations across the corporate governance variables. *Revenue, Assets, Total Bank Payments, EBITDA* (earnings before interest, taxes, depreciation and amortization), and *Debt* are taken from Rosstat. *Total Bank Payments* represents the total amount of money paid from the firm's bank account. The remaining variables are manually collected from companies' quarterly reports. *ADR* is a variable that takes a value of one if the company has ADRs (American Depositary Receipts) and zero otherwise. *Tobin's Q* is computed as total assets less the book value of equity plus the market value of equity divided by total assets. *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 ownership* represents the CEO's company's stock ownership as a percentage of total market capitalization. *CEO on board* and *Foreigner on board* are variables that take values of one if, respectively, the CEO has a seat on the board or a foreigner serves on the board. *Owned by government* is a variable that takes a value of one if the government owns more than 20% of company shares and zero otherwise. The *Tax enforcement* variable is defined as equal to 1 starting in 2002 for the top 10% largest companies by market capitalization as of 2001 not controlled by the government. The variable takes value zero in years 1999 through 2001.

	Mean	Median	St. dev.	N of obs.	N of firms
	(1)	(2)	(3)	(4)	(5)
Panel A. Summary statistics for entire sample					
Revenue, $000's	683,707	143,075	2,239,771	687	156
Assets, $000's	1,287,107	174,493	6,499,900	687	156
Total Bank Payments, $000's	683,841	53,513	3,272,284	687	156
EBITDA, $000's	143,542	8,560	578,406	682	156
EBITDA / Revenue	0.166	0.138	0.131	682	156
Debt / Assets	0.165	0.117	0.155	687	156
Publicly traded	0.642	1.000	0.480	687	156
ADR	0.073	0.000	0.260	687	156
Audit by Big 5	0.182	0.000	0.386	687	156
Board size	8.454	8.000	2.646	687	156
CEO ownership	0.016	0.000	0.063	678	154
CEO on board	0.833	1.000	0.374	687	156
Foreigner on board	0.146	0.000	0.353	687	156
Owned by government	0.277	0.000	0.448	687	156
Tax enforcement	0.023	0.000	0.151	687	156

Panel B. Summary statistics for companies with ADR

Revenue, $000's	4,235,368	1,072,100	6,710,728	45	13
Assets, $000's	9,199,321	1,779,458	19,685,980	45	13
Total Bank Payments, $000's	4,603,213	669,044	10,182,055	45	13
EBITDA, $000's	1,061,749	244,233	1,677,518	45	13
EBITDA / Revenue	0.286	0.287	0.136	45	13
Debt / Assets	0.176	0.175	0.125	45	13
Market cap	7,215,699	1,677,592	12,764,289	45	13
Tobin's Q	1.168	1.039	0.625	45	13
Audit by Big 5	0.622	1.000	0.490	45	13
Board size	9.600	10.000	2.209	45	13
CEO ownership	0.004	0.001	0.013	45	13
CEO on board	0.844	1.000	0.367	45	13
Foreigner on board	0.356	0.000	0.484	45	13
Owned by government	0.400	0.000	0.495	45	13
Tax enforcement	0.267	0.000	0.447	45	13

Panel C. Average values per year

	1999	2000	2001	2002	2003	2004
Revenue, $000's	341,133	508,280	499,499	601,783	832,652	1,090,154
Assets $000's	1,181,515	841,586	1,058,525	1,193,960	1,467,456	1,850,593
Bank receipts $000's	160,552	422,917	514,966	516,345	837,096	1,305,279
EBITDA, $000's	70,712	117,124	112,789	102,451	163,295	245,042
EBITDA / Revenue	0.193	0.189	0.170	0.170	0.152	0.141
Debt / Assets	0.093	0.121	0.153	0.175	0.198	0.204
Publicly traded	0.421	0.607	0.694	0.523	0.748	0.731
ADR	0.053	0.043	0.065	0.086	0.087	0.090
Audit by Big 5	0.175	0.188	0.177	0.172	0.189	0.187
Board size	9.263	8.761	8.516	8.313	8.236	8.127
CEO ownership	0.017	0.016	0.015	0.014	0.015	0.020
CEO on board	0.912	0.932	0.798	0.844	0.803	0.761
Foreigner on board	0.053	0.162	0.129	0.180	0.142	0.157
Owned by government	0.404	0.256	0.306	0.273	0.268	0.224
Tax enforcement	0.000	0.000	0.000	0.047	0.039	0.037
Number of observations	57	117	124	128	127	134

Panel D. Correlation matrix

	ADR	Audit by Big 5	Foreigner on board	Log (Board size)	CEO on board
ADR	1				
Audit by Big 5	0.3181	1			
Foreigner on board	0.1386	0.1156	1		
Log (Board size)	0.1196	0.1517	-0.0411	1	
CEO on board	0.0055	-0.0311	-0.0139	0.087	1

Table 2

Summary Statistics for Income Diversion

The table presents income diversion measures. *ShadowP = Net transfers to spacemen/Total Payments, ShadowA = Net transfers to spacemen/Assets,* and *ShadowR = Net transfers to spacemen/Revenue*, where *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, and *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
	(1)	(2)	(3)	(4)	(5)
Panel A. Summary statistics for the entire sample					
ShadowR	0.018	0.008	0.024	687	156
ShadowA	0.017	0.006	0.024	687	156
ShadowP	0.027	0.017	0.029	687	156
Panel B. Summary statistics for companies with ADR					
ShadowR	0.013	0.009	0.015	45	13
ShadowA	0.009	0.005	0.013	45	13
ShadowP	0.018	0.009	0.024	45	13

Table 3

Income Diversion by Top Listed Russian Companies

The table shows the top 20 largest listed companies by accumulated income diversion ($000's) 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 of 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 Tax per month, an amount that approximately corresponds 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
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
LKOH	Lukoil	.	3,134,821	3,647,323	263,772	228,527	174,024	7,448,467
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	.	.	443,168	80,928	20,724	76,340	621,160
NLMK	NLMK	27,625	43,348	38,356	47,563	121,348	78,177	356,417
TATN	Tatneft	.	72,253	42,344	97,873	100,554	29,105	342,130
TNKO	TNK	.	.	.	.	89,691	191,880	281,572
SDNK	Sidanko	.	73,684	.	171,136	7,193	.	252,013
YUKO	Yukos	.	73,233	74,505	40,260	.	.	187,998
ROSN	Rosneft	.	.	.	.	60,458	127,281	187,740
MSNG	Mosenergo	1,511	6,346	16,322	6,587	75,771	18,433	124,970
MGOK	Mikhailovsky GOK	1,359	6,443	2,039	1,467	33,264	79,345	123,917
UDMN	Udmurneft	.	4,003	9,660	513	38,665	56,004	108,845
AGKK	Rusal	5,482	.	49,889	12,962	14,769	25,124	108,225
PFGS	Rosneft-Purneftegaz	.	23,394	14,735	4,022	13,550	25,376	81,076
CHMK	ChMK	.	40,791	17,077	2,968	4,696	14,140	79,673
RTKM	Rostelekom	.	3,430	7,580	12,649	27,650	27,128	78,437
MTSS	MTS	.	2,274	7,444	12,186	14,135	40,916	76,956
SLAV	Slavneft	.	.	.	75,628	.	.	75,628
MFGS	SN-MNG	2,872	8,700	5,668	11,502	9,920	34,886	73,548

Table 4

Income Diversion by Companies in the

Tax Avoidance Memorandum

The table shows *ShadowR= Net transfers to spacemen/Revenue* between 1999 and 2004 for the 4 companies cited in the tax avoidance memorandum released in July 2000 by the Russian Ministry of Finance. *Net transfers to spacemen* is the net cash transferred to spacemen by a firm. A firm is defined as a spaceman if it satisfies all of 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 Tax per month, an amount that approximately corresponds 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
SIBN	Sibneft	0.0166	0.0206	0.0367	0.0193	0.0113	0.0096
TNKO	TNK	0.0744	0.0534	0.0590	0.0265	0.0267	0.0350
SLAV	Slavneft	0.0461	0.0626	0.0603	0.0460	.	.
YUKO	Yukos	0.0106	0.0569	0.0790	0.0527	.	.

Table 5

Change in Income Diversion

Panel A shows the cross-section regression of change in *ShadowR=Net transfers to spacemen/Revenue* in year *T* relative to year *T-1*, where *T* ranges from 2000 through 2004 on the variable *ShadowR*, the company's (Log) *Revenue*, and a set of firm variables: *Revenue growth, Owned by government* and *Debt/Assets*, all of them as of year *T-1*. The regression includes industry dummies taken from Fama and French 12 industry classification criteria. In Panel B we include the corporare governance variables: *ADR, Audit by Big 5, Board size, CEO on board, and Foreigner on board*. All the variables are defined in Table 1. Panel C presents the regression of the change in *ShadowR* in year 2002 relative to 2001 on *ShadowR*, (Log) *Revenues* and the firm variables, all as of 2001. In each specification (1) through (5) we include a corporate governance variable. Specification (6) includes all the corporate governance variables simultaneously. We control for industry fixed-effects. Standard errors are in parentheses. ***, **, * denote, respectively, significance at the 1%, 5% and 10% level. *ShadowR,* Log (*Board size*), Log (*Revenue*), *Revenue growth* and *Debt/Assets* are winsorized at the top 95th percentile.

Panel A

Dependent variable	ShadowR(T)-ShadowR(T-1)				
Year (T)	2000	2001	2002	2003	2004
ShadowR(T-1)	-0.5186	-0.2097	-0.4644	-0.4010	-0.2776
	(0.2994)*	(0.0857)**	(0.0964)***	(0.1111)***	(0.0977)***
Log(Revenue)	0.0024	-0.0001	-0.0018	-0.0009	0.0004
	(0.0025)	(0.001)	(0.0008)**	(0.0012)	(0.0007)
Corporate governance variables	N	N	N	N	N
Firm variables	Y	Y	Y	Y	Y
Industry dummy	Y	Y	Y	Y	Y
R-sq	0.284	0.236	0.343	0.204	0.155
Number of firms	57	114	124	127	126

Panel B

Dependent variable	ShadowR(T)-ShadowR(T-1)				
Year	2000	2001	2002	2003	2004
ShadowR(T-1)	-0.7564	-0.2192	-0.4610	-0.3917	-0.2799
	(0.2747)***	(0.0788)***	(0.1006)***	(0.1139)***	(0.1)***
Log(Revenue)	0.0012	-0.0010	-0.0019	-0.0003	0.0002
	(0.0035)	(0.0013)	(0.001)*	(0.0013)	(0.0009)
Corporate governance variables	Y	Y	Y	Y	Y
Revenue growth, Debt/Assets, Government	Y	Y	Y	Y	Y
Industry dummy	Y	Y	Y	Y	Y
R-sq	0.423	0.288	0.344	0.216	0.164
Number of firms	57	114	124	127	126

Panel C

Dependent variable	ShadowR (2002) - ShadowR(2001)					
	(1)	(2)	(3)	(4)	(5)	(6)
ShadowR(2001)	-0.4646	-0.4645	-0.4625	-0.4626	-0.4641	-0.4610
	(0.0974)***	(0.0974)***	(0.0951)***	(0.0994)***	(0.0966)***	(0.1006)***
ADR	-0.0003					-0.0001
	(0.0051)					(0.0051)
Audit by big 5		0.0000				-0.0003
		(0.0037)				(0.0039)
Foreigner serves on board			0.0024			0.0024
			(0.0058)			(0.006)
Log (Board size)				-0.0009		-0.0005
				(0.0061)		(0.0063)
Ceo on board					0.0004	0.0004
					(0.0035)	(0.0036)
Owned by government	0.0042	0.0041	0.0044	0.0043	0.0041	0.0044
	(0.0039)	(0.0039)	(0.0038)	(0.0039)	(0.0039)	(0.004)
Log(Revenue)	-0.0018	-0.0018	-0.0019	-0.0018	-0.0018	-0.0019
	(0.0009)**	(0.0009)**	(0.0009)**	(0.0009)**	(0.0008)**	(0.001)*
Revenue growth	-0.0056	-0.0055	-0.0056	-0.0057	-0.0056	-0.0058
	(0.0089)	(0.0088)	(0.0088)	(0.0084)	(0.0088)	(0.0087)
Debt/Assets	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057
	(0.0154)	(0.0156)	(0.0153)	(0.0154)	(0.0154)	(0.0158)
Industry dummy	Y	Y	Y	Y	Y	Y
R-sq	0.343	0.343	0.344	0.343	0.343	0.344
Number of firms	124	124	124	124	124	124

Table 6

Income Diversion by Top Listed Russian Companies

The table shows *ShadowR= Net transfers to spacemen/Revenue* between 1999 and 2004 for the top 10% of firms by 2001 market capitalization not controlled by the government. *Net transfers to spacemen* is the net cash transferred to spacemen by a firm. A firm is defined as a spaceman if it satisfies all of 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 Tax per month, an amount that approximately corresponds 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
LKOH	Lukoil	.	0.0848	0.0848	0.0363	0.0257	0.0132
CHMF	Severstal	0.0538	0.0701	0.0848	0.0284	0.0341	0.0770
YUKO	Yukos	0.0105	0.0569	0.0790	0.0527	.	.
MTSS	MTS	.	0.0040	0.0085	0.0114	0.0086	0.0184
GMKN	Norilsk Nickel	.	.	0.0848	0.0291	0.0045	0.0130
SNGS	Surgutneftegas	.	0.0009	0.0014	0.0007	0.0003	0.0007

Table 7

Income Diversion and Tax Enforcement

The table shows the regression of *ShadowR= Net transfers to spacemen/Revenue* on the variable *Tax enforcement* and a set of corporate governance variables controlling for the company's (Log) *Revenue, Revenue growth, Debt/Assets, Year* and *Firm dummies.* All the variables are defined in Table 1. The variable *Tax enforcement* takes value 1 for 2002, 2003, and 2004 if the company is not controlled by the government and belongs to the top 10% 2001 market capitalization; it takes value of 0 otherwise. Standard errors are in parentheses. ***, **, * denote, respectively, significance at the 1%, 5% and 10% level. The standard errors are clustered at the firm level. *ShadowR,* Log (*Board size*), Log (*Revenue*), *Revenue growth* and *Debt/Assets* are winsorized at the top 95th percentile. Top 95th percentile.

Dependent variable	ShadowR						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Tax enforcement	-0.0287	-0.0292	-0.0242	-0.0348	-0.0175	0.0460	-0.0178
	(0.0114)**	(0.0111)***	(0.0039)***	(0.0172)**	(0.0084)**	(0.0631)	(0.0075)**
ADR		-0.0046	-0.0037				
		(0.0087)	(0.0082)				
Tax enforcement*ADR			-0.0052				
			(0.0172)				
Audit by big 5		0.0026		0.0028			
		(0.0041)		(0.0041)			
Tax enforcement*Audit by big 5				0.0091			
				(0.0204)			
Foreigner serves on board		0.0041			0.0050		
		(0.0046)			(0.0045)		
Tax enforcement*Foreigner					-0.0218		
					(0.0205)		
Log (Board size)		0.0006				0.0007	
		(0.005)				(0.0048)	
Tax enforcem.*Log (Board size)						-0.0336	
						(0.0277)	
Ceo on board		-0.0020					-0.0015
		(0.0025)					(0.0025)
Tax enforcement*Ceo on board							-0.0147
							(0.0069)**

Log(Revenue)	-0.0033	-0.0032	-0.0031	-0.0033	-0.0033	-0.0034	-0.0033
	(0.0023)	(0.0023)	(0.0023)	(0.0023)	(0.0023)	(0.0023)	(0.0023)
Revenue growth	-0.0075	-0.0072	-0.0077	-0.0076	-0.0071	-0.0073	-0.0073
	(0.0052)	(0.0053)	(0.0053)	(0.0053)	(0.0053)	(0.0053)	(0.0052)
Debt/Assets	0.0081	0.0081	0.0078	0.0073	0.0093	0.0077	0.0075
	(0.0084)	(0.0083)	(0.0085)	(0.0083)	(0.0084)	(0.0084)	(0.0084)
Year dummy	Y	Y	Y	Y	Y	Y	Y
Firm dummy	Y	Y	Y	Y	Y	Y	Y
R-sq	0.088	0.093	0.089	0.090	0.096	0.092	0.092
Number of observations	687	687	687	687	687	687	687
Number of firms	156	156	156	156	156	156	156

Table 8

Income Diversion and Corporate Governance

The table shows the regression of *ShadowR= Net transfers to spacemen/Revenue* on a set of corporate governance variables controlling for government ownership (*Owned by government*), the company's (Log) *Revenue, Revenue growth,* and *Debt/Assets*. All the variables are defined in Table 1. All specifications include year and industry dummies (Fama and French 12 industry classification). Standard errors are in parentheses. ***, **, * denote, respectively, significance at the 1%, 5% and 10% level. The standard errors are clustered at the firm level. *ShadowR,* Log (*Board size*), Log (*Revenue*), *Revenue growth* and *Debt/Assets* are winsorized at the top 95th percentile.

Dependent variable				ShadowR			
	-1	(2)	(3)	(4)	(5)	(6)	(7)
ADR	-0.0068						-0.0077
	(0.0036)*						(0.0037)**
Audit by big 5		0.0016					0.0019
		(0.0038)					(0.0037)
Foreigner serves on board			0.0040			0.0043	0.0046
			(0.0033)			(0.0033)	(0.0033)
Log (Board size)				0.0049		0.0055	0.0056
				(0.004)		(0.004)	(0.004)
Ceo on board					-0.0030	-0.0033	-0.0031
					(0.0027)	(0.0027)	(0.0027)
Owned by government	-0.0019	-0.0023	-0.0018	-0.0029	-0.0020	-0.0025	-0.0024
	(0.003)	(0.0031)	(0.0031)	(0.0031)	(0.0031)	(0.0031)	(0.0031)
Log(Revenue)	-0.0002	-0.0007	-0.0007	-0.0008	-0.0006	-0.0010	-0.0008
	(0.0011)	(0.0011)	(0.0011)	(0.0011)	(0.0011)	(0.0012)	(0.0012)
Revenue growth	-0.0101	-0.0100	-0.0098	-0.0092	-0.0096	-0.0084	-0.0086
	(0.0055)*	(0.0055)*	(0.0054)*	(0.0055)*	(0.0054)*	(0.0053)	(0.0054)
Debt/Assets	0.0206	0.0203	0.0206	0.0211	0.0201	0.0205	0.0200
	(0.0081)**	(0.0083)**	(0.008)**	(0.0081)***	(0.0082)**	(0.0081)**	(0.0082)**
Year dummy	Y	Y	Y	Y	Y	Y	Y
Industry dummy	Y	Y	Y	Y	Y	Y	Y

R-sq	0.098	0.094	0.097	0.097	0.096	0.103	0.109
Number of observations	687	687	687	687	687	687	687
Number of firms	156	156	156	156	156	156	156

Table 9

Income Diversion and Tax Enforcement

Robustness test: Top 5% 2001 market capitalization

The table shows the regression of *ShadowR= Net transfers to spacemen/Revenue* on the variable *Tax enforcement* and a set of corporate governance variables controlling for the company's (Log) *Revenue. Revenue growth, Debt/Assets*, *Year* and *Firm dummies*. All the variables are defined in Table 1. The variable *Tax enforcement* takes value 1 for 2002, 2003, and 2004 if the company is not controlled by the government and belongs to the top 5% 2001 market capitalization; it takes value of 0 otherwise. Standard errors are in parentheses. ***, **, * denote, respectively, significance at the 1%, 5% and 10% level. The standard errors are clustered at the firm level. *ShadowR,* Log (*Board size*), Log (*Revenue*), *Revenue growth* and *Debt/Assets* are winsorized at the top 95th percentile. Top 95th percentile.

Dependent variable	ShadowR							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Tax enforcement	-0.0301	-0.0279	-0.0290	-0.0155	-0.0040	-0.0039	0.3979	-0.0156
	(0.0175)*	(0.0158)*	(0.0167)*	(0.0026)***	(0.0017)**	(0.0017)**	(0.1487)***	(0.0027)***
ADR		-0.0039	-0.0041	-0.0024				
		(0.0066)	(0.0068)	(0.0061)				
Tax enforcement*ADR				-0.0168				
				(0.0218)				
Audit by big 5			0.0009		0.0014			
			(0.004)		(0.0038)			
Tax enforcement*Audit by big 5					-0.0431			
					(0.016)***			
Foreigner serves on board			0.0033			0.0042		
			(0.005)			(0.0049)		
Tax enforcement*Foreigner						-0.0458		
						(0.0178)**		
Log (Board size)			0.0001				-0.0002	
			(0.005)				(0.0049)	
Tax enforcement*Log (Board size)							-0.1932	
							(0.0715)***	
Ceo on board			-0.0019					-0.0019
			(0.0025)					(0.0025)
Tax enforcement*Ceo on board								-0.0185

								(0.0217)
Log(Revenue)	-0.0032	-0.0031	-0.0032	-0.0031	-0.0033	-0.0034	-0.0033	-0.0032
	(0.0022)	(0.0023)	(0.0023)	(0.0023)	(0.0023)	(0.0023)	(0.0023)	(0.0022)
Revenue growth	-0.0084	-0.0085	-0.0081	-0.0085	-0.0083	-0.0079	-0.0083	-0.0083
	(0.0054)	(0.0054)	(0.0054)	(0.0054)	(0.0054)	(0.0054)	(0.0053)	(0.0053)
Debt/Assets	0.0058	0.0055	0.0059	0.0059	0.0057	0.0066	0.0059	0.0061
	(0.0082)	(0.0083)	(0.0082)	(0.0083)	(0.0081)	(0.0081)	(0.0083)	(0.0082)
Year dummy	Y	Y	Y	Y	Y	Y	Y	Y
Fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
R-sq	0.073	0.073	0.076	0.074	0.082	0.084	0.081	0.075
Number of observations	687	687	687	687	687	687	687	687
Number of firms	156	156	156	156	156	156	156	156

Table 10

Income Diversion and Tax Enforcement

Robustness test: Top 25% 2001 market capitalization

The table shows the regression of *ShadowR= Net transfers to spacemen/Revenue* on the variable *Tax enforcement* and a set of corporate governance variables controlling for the company's (Log) *Revenue*, *Revenue growth*, *Debt/Assets*, *Year* and *Firm dummies*. All the variables are defined in Table 1. The variable *Tax enforcement* takes value 1 for 2002, 2003, and 2004 if the company is not controlled by the government and belongs to the top 25% 2001 market capitalization; it takes value of 0 otherwise. Standard errors are in parentheses. ***, **, * denote, respectively, significance at the 1%, 5% and 10% level. The standard errors are clustered at the firm level. *ShadowR,* Log (*Board size*), Log (*Revenue*), *Revenue growth* and *Debt/Assets* are winsorized at the top 95th percentile. Top 95th percentile.

Dependent variable	ShadowR							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Tax enforcement	-0.0162	-0.0154	-0.0156	-0.0122	-0.0145	-0.0122	0.0494	-0.0092
	(0.0066)**	(0.006)**	(0.006)***	(0.0063)*	(0.0083)*	(0.0064)*	(0.0214)**	(0.0049)*
ADR		-0.0091	-0.0096	-0.0070				
		(0.0106)	(0.011)	(0.0092)				
Tax enforcement*ADR				-0.0094				
				(0.0143)				
Audit by big 5			0.0010		0.0017			
			(0.0041)		(0.0042)			
Tax enforcement*Audit by big 5					-0.0030			
					(0.0121)			
Foreigner serves on board			0.0031			0.0037		
			(0.005)			(0.0048)		
Tax enforcement*Foreigner						-0.0115		
						(0.0151)		
Log (Board size)			0.0003				0.0003	
			(0.0051)				(0.0049)	
Tax enforcement*Log (Board size)							-0.0302	
							(0.0111)***	
Ceo on board			-0.0019					-0.0010
			(0.0025)					(0.0027)

Tax enforcement*Ceo on board								-0.0092
								(0.0046)**
Log(Revenue)	-0.0031	-0.0028	-0.0029	-0.0029	-0.0031	-0.0031	-0.0034	-0.0032
	(0.0022)	(0.0022)	(0.0023)	(0.0022)	(0.0022)	(0.0022)	(0.0023)	(0.0023)
Revenue growth	-0.0076	-0.0078	-0.0075	-0.0078	-0.0076	-0.0075	-0.0069	-0.0073
	(0.0052)	(0.0052)	(0.0053)	(0.0052)	(0.0053)	(0.0052)	(0.0052)	(0.0052)
Debt/Assets	0.0066	0.0059	0.0062	0.0059	0.0064	0.0075	0.0063	0.0065
	(0.0085)	(0.0086)	(0.0084)	(0.0087)	(0.0084)	(0.0084)	(0.0085)	(0.0084)
Year dummy	Y	Y	Y	Y	Y	Y	Y	Y
Firm dummy	Y	Y	Y	Y	Y	Y	Y	Y
R-sq	0.080	0.082	0.085	0.084	0.080	0.084	0.087	0.083
Number of observations	687	687	687	687	687	687	687	687
Number of firms	156	156	156	156	156	156	156	156

Table 11

Income Diversion and Tax Enforcement

Robustness test: Quantile regressions

The table shows the regression of *ShadowR= Net transfers to spacemen/Revenue* on the variable *Tax enforcement* and a set of corporate governance variables controlling for the company's (Log) *Revenue, Revenue growth, Debt/Assets*, *Year* and *Firm dummies.* All the variables are defined in Table 1. In Panel A we create four tax enforcement dummies that take value 1 for 2002, 2003, and 2004 if the firm is private (Private Quartile) and belongs, respectively, to the first quartile (largest firms by 2001 market capitalization) down to the fourth quartile (smallest firms); the dummy variables take value zero otherwise. We repeat the same procedure for government-controlled firms (Gov Quartile).In Panel B we repeat the same procedure replacing quartiles with deciles. The top (bottom) decile for private (owned by government) firms includes the top (bottom) 10% largest (smallest) firms by 2001 market capitalization. Standard errors are in parentheses. ***, **, * denote, respectively, significance at the 1%, 5% and 10% level. The standard errors are clustered at the firm level. *ShadowR,* Log (*Board size*), Log (*Revenue*), *Revenue growth* and *Debt/Assets* are winsorized at the top 95th percentile. Top 95th percentile.

	Panel A		
Dependent variable	ShadowR		
	(1)	(2)	(3)
Private Quartile 1 after 2001	-0.0149		-0.0151
	(0.0062)**		(0.0065)**
Private Quartile 2 after 2001	0.0074		0.0069
	(0.0063)		(0.0067)
Private Quartile 3 after 2001	0.0000		-0.0003
	(0.0044)		(0.0048)
Private Quartile 4 after 2001	-0.0010		-0.0014
	(0.0056)		(0.0059)
Gov Quartile 1 after 2001		-0.0035	-0.0051
		(0.005)	(0.0052)
Gov Quartile 2 after 2001		0.0069	0.0044
		(0.0052)	(0.0049)
Gov Quartile 3 after 2001		-0.0060	-0.0072
		(0.0029)**	(0.0035)**
Gov Quartile 4 after 2001		0.0078	0.0065
		(0.0057)	(0.006)
Controls	Y	Y	Y
Year dummy	Y	Y	Y

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	(1)	(2)	(3)
Fixed effects	Y	Y	Y
R-sq	0.090	0.073	0.099
Number of observations	687	687	687
Number of firms	156	156	156

Panel B

Dependent variable		ShadowR	
	(1)	(2)	(3)
Private Decile 1 after 2001	-0.0284		-0.0273
	(0.0111)**		(0.011)**
Private Decile 2 after 2001	0.0014		0.0009
	(0.0036)		(0.0043)
Private Decile 3 after 2001	0.0073		0.0067
	(0.0126)		(0.0128)
Private Decile 4 after 2001	0.0064		0.0058
	(0.0034)*		(0.0042)
Private Decile 5 after 2001	-0.0102		-0.0108
	(0.0098)		(0.01)
Private Decile 6 after 2001	-0.0019		-0.0024
	(0.0045)		(0.0049)
Private Decile 7 after 2001	0.0009		0.0003
	(0.0097)		(0.0099)
Private Decile 8 after 2001	0.0089		0.0085
	(0.0076)		(0.0078)
Private Decile 9 after 2001	-0.0008		-0.0015
	(0.0035)		(0.0041)
Private Decile 10 after 2001	-0.0102		-0.0110
	(0.0082)		(0.0086)
Gov Decile 1 after 2001		0.0014	-0.0008
		(0.0043)	(0.004)

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Gov Decile 2 after 2001		-0.0101	-0.0112
		(0.0123)	(0.0123)
Gov Decile 3 after 2001		0.0009	-0.0005
		(0.0031)	(0.0035)
Gov Decile 4 after 2001		0.0209	0.0115
		(0.0116)*	(0.0081)
Gov Decile 5 after 2001		-0.0002	-0.0017
		(0.0074)	(0.0079)
Gov Decile 6 after 2001		-0.0051	-0.0065
		(0.0041)	(0.0046)
Gov Decile 7 after 2001		-0.0073	-0.0086
		(0.0031)**	(0.0038)**
Gov Decile 8 after 2001		0.0059	0.0047
		(0.0055)	(0.0059)
Gov Decile 9 after 2001		0.0040	0.0027
		(0.0093)	(0.0095)
Gov Decile 10 after 2001		0.0086	0.0071
		(0.0118)	(0.0119)
Controls	Y	Y	Y
Year dummy	Y	Y	Y
Fixed effects	Y	Y	Y
R-sq	0.109	0.077	0.120
Number of observations	687	687	687
Number of firms	156	156	156

Figure 1

Evolution of Income Diversion for Different Sets of Companies

The graph shows the evolution of average *ShadowR= Net transfers to spacemen/Revenue* for 4 sets of companies from 1999 through 2004. *Net transfers to spacemen* is the net cash transferred to spacemen by a firm. The *List of companies in the memorandum* includes *Sibneft, Slavneft, Yukos and TNK*. The *Sample of large "target" companies* includes *Lukoil, Severstal, Yukos, MTS, Norilsk Nickel,* and *Surgutneftegas*. These companies belong to the largest 10% of companies by market capitalization in 2001 not controlled by the government. The *Sample of large government controlled companies* includes *Tatneft, Mosenergo,* and *Gazprom.* The *Control sample* includes the rest of companies in our sample.
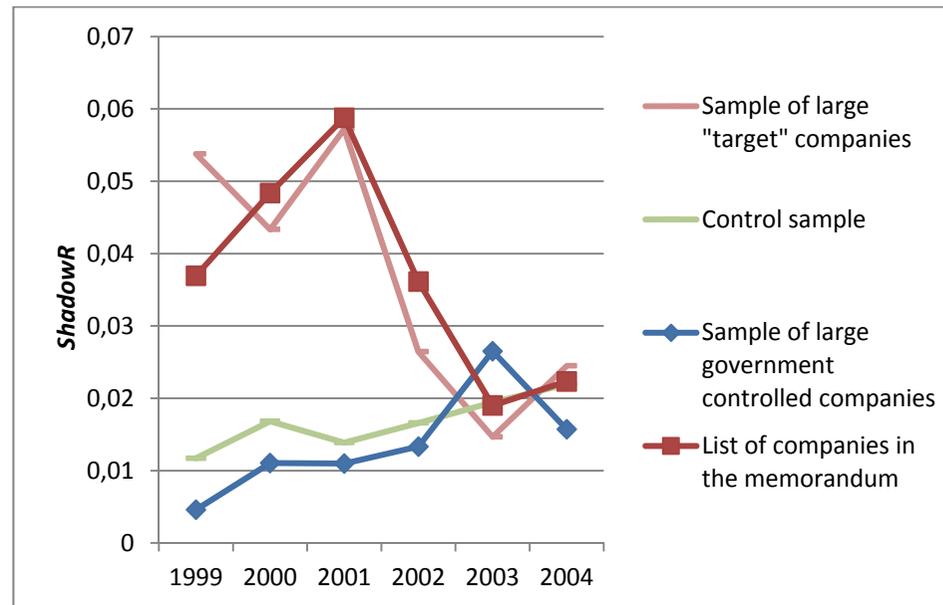
APPENDIX

Table A1

Summary Statistics for Gross Income Diversion

The table presents income diversion measures. *Gross ShadowP = Gross transfers to spacemen/Total Payments, Gross ShadowA = Gross transfers to spacemen/Assets,* and *Gross ShadowR = Gross transfers to spacemen/Revenue*, where *Gross transfers to spacemen* is the gross cash transferred to spacemen by a firm, *Total Payments* represents the total amount of money paid from the firm's bank account, and *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
	(1)	(2)	(3)	(4)	(5)
Panel A. Summary statistics for the entire sample					
Gross ShadowR	0.024	0.010	0.030	687	156
Gross ShadowA	0.023	0.010	0.032	687	156
Gross ShadowP	0.038	0.023	0.041	687	156
Panel B. Summary statistics for companies with ADR					
Gross ShadowR	0.017	0.011	0.020	45	13
Gross ShadowA	0.013	0.007	0.018	45	13
Gross ShadowP	0.023	0.012	0.029	45	13

Table A2

Income Diversion and Tax Enforcement

Gross ShadowR

The table shows the regression of *Gross ShadowR= Gross transfers to spacemen/Revenue* on the variable *Tax enforcement* and a set of corporate governance variables controlling for the company's (Log) *Revenue, Revenue growth, Debt/Assets, Year* and *Firm dummies*. All the variables are defined in Table 1. The variable *Tax enforcement* takes value 1 for 2002, 2003, and 2004 if the company is not controlled by the government and belongs to the top 10% 2001 market capitalization; it takes value of 0 otherwise. Standard errors are in parentheses. ***, **, * denote, respectively, significance at the 1%, 5% and 10% level. The standard errors are clustered at the firm level. *Gross ShadowR,* Log (*Board size*), Log (*Revenue*), *Revenue growth* and *Debt/Assets* are winsorized at the top 95th percentile. Top 95th percentile.

Dependent variable	ShadowR						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Tax enforcement	-0.0374	-0.0378	-0.0359	-0.0451	-0.0234	0.0608	-0.0263
	(0.0137)***	(0.0138)***	(0.0027)***	(0.0222)**	(0.0114)**	(0.0787)	(0.0102)***
ADR		-0.0049	-0.0044				
		(0.0099)	(0.0099)				
Tax enforcement*ADR			-0.0004				
			(0.0208)				
Audit by big 5		0.0016		0.0018			
		(0.0049)		(0.0049)			
Tax enforcement*Audit by big 5				0.0120			
				(0.0255)			
Foreigner serves on board		0.0048			0.0058		
		(0.0054)			(0.0053)		
Tax enforcement*Foreigner					-0.0272		
					(0.025)		
Log (Board size)		0.0017				0.0018	
		(0.0065)				(0.0062)	
Tax enforcem.*Log (Board size)						-0.0442	
						(0.0342)	

Ceo on board	-0.0022						-0.0017
	(0.0031)						(0.0031)
Tax enforcement*Ceo on board							-0.0150
							(0.0083)*
Log(Revenue)	-0.0046	-0.0046	-0.0045	-0.0047	-0.0047	-0.0048	-0.0047
	(0.0031)	(0.0032)	(0.0031)	(0.0031)	(0.0031)	(0.0031)	(0.0031)
Revenue growth	-0.0088	-0.0083	-0.0089	-0.0088	-0.0083	-0.0085	-0.0085
	(0.0065)	(0.0066)	(0.0065)	(0.0065)	(0.0065)	(0.0065)	(0.0065)
Debt/Assets	0.0129	0.0133	0.0125	0.0120	0.0143	0.0125	0.0123
	(0.0112)	(0.0111)	(0.0114)	(0.0111)	(0.0112)	(0.0111)	(0.0112)
Year dummy	Y	Y	Y	Y	Y	Y	Y
Firm dummy	Y	Y	Y	Y	Y	Y	Y
R-sq	0.087	0.091	0.087	0.088	0.094	0.091	0.090
Number of observations	687	687	687	687	687	687	687
Number of firms	156	156	156	156	156	156	156