

## Corrupt Auditors and Corporate Theft

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### Abstract

We examine the relationship between auditing and corporate theft in a sample of 25,824 private and publicly listed companies in Russia. We measure theft by identifying transfers of money from our sample companies to shell entities created for the purpose of facilitating fraudulent transactions. An average company diverts 7.3% of its revenue to fraudulent entities, whereas companies that are audited divert 0.7% less of their revenue. Firms audited by Big 4 audit firms divert even less. Big 4 audit firms receive more audit and non-audit fees when their clients transfer more money to fraudulent entities. This positive link between fees to auditors and corporate theft is particularly strong for auditing firms whose senior employees have a high Propensity to Corrupt (PTC) score. We also find that the PTC of Big 4 auditors is positively correlated with the corporate theft of their clients. Finally, we find that firms that are audited by the Big 4 benefit from a lower cost of capital, which motivates clients to choose Big 4 auditors even if such auditors constrain the diversion of corporate resources for private benefit. Overall, these findings suggest a beneficial role for auditors, especially the Big 4 firms, in lowering corporate theft and improving costs of capital even in a country with low litigation risk for auditors and with low-quality institutions devoted to investor protection.

**Keywords:** Audit quality, Big 4 auditors, corporate governance, income diversion, audit fees

**JEL Codes:** D73, G30, G38, H26, H83, M42

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## 1. Introduction

We examine the relationship between auditing and theft of corporate resources in Russia, an economy characterized by a low level of law enforcement and litigation risk for auditors. In particular, we examine whether the presence of Big 4 auditors is associated with lower corporate kleptocracy in Russia. Prior research finds that Big 4 auditors are associated with higher accounting quality in the U.S. (Teoh and Wong 1993, Defond and Jiambalvo 1993, and Becker et al. 1998). Internationally, however, the effectiveness of Big 4 auditors in improving accounting quality is found to vary with the strength of investor protection in the country, and the effectiveness is lower in countries with weaker investor protection regimes (Francis and Wang 2008). The Big 4 have also been involved in serious cases of audit weakness across the world, though systematic evidence of the effect of auditors on the likelihood of fraud across countries is limited.<sup>1</sup>

A vast body of literature examines the effect of cross-country variation in institutional features such as law enforcement and litigation effectiveness on financial reporting and corporate governance (for example, La Porta et al., 1997; Ball et al., 2000; Defond and Hung, 2004; Srinivasan et al., 2014). One institutional feature driving audit quality is the litigation risk faced by auditors, which varies significantly across countries, as documented in La Porta et al. (2006). Audit quality, especially for clients audited by the Big 4, is observed to be higher in countries with greater litigation risk (Seetharaman et al., 2002; Choi et al., 2009). However, we still have much to learn about the situation in countries with different institutional settings, e.g., low litigation risk. Large audit firms are global organizations with incentives to maintain their reputation for high quality across countries, including low-litigation countries. They have

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<sup>1</sup> See discussion in Weber et al. (2008) for the Comroad AG fraud (in Germany) audited by KPMG, Skinner and Srinivasan (2012) for the Kanebo fraud (in Japan) audited by PwC, Grove and Victoravich (2014) for the Longtop fraud (in China) audited by Deloitte and the Bhasin (2013) for the Satyam Computers fraud (in India) audited by PwC.

training and knowledge sharing practices that can potentially provide a consistent level of audit quality across the world (Simunic and Stein 1987; Francis and Wang 2008). Reputational concerns provide incentives for auditors even in low-litigation countries to provide high-quality audits. Weber et al. (2008) and Skinner and Srinivasan (2012) show in the low-litigation countries Germany and Japan, respectively, that audit firms pay a reputational penalty for low-quality audits.

The data availability in Russia presents a unique opportunity to analyze the effect of audit on corporate theft in detail. Most existing approaches to measure earnings management suffer from various types of alternative interpretations. Because our data allows for direct measuring of the diversion of corporate resources by managers, as well as audit and non-audit fees paid to auditors, we provide a comprehensive analysis of the client-auditor relationships.

This paper makes three contributions to the literature. First, we show that even in a country with a weak legal environment, audited firms exhibit a significantly lower level of corporate theft than non-audited firms. This reduction is even stronger for firms audited by Big 4 auditors. Second, we document that Big 4 auditors charge higher audit and non-audit fees to clients who divert more money to fraudulent entities. Finally, we find that the most likely explanation for this positive link is the corruptness of the auditors. The higher the Propensity to Corrupt (PTC) of among the auditor senior staff, the stronger the positive relationship between the auditor fees and the corporate theft of their clients.<sup>2</sup>

We provide evidence on the effectiveness of auditors by focusing on one type of corporate fraud: diversion of corporate resources by managers. We study this in Russia, an economy characterized by weak shareholder rights and enforcement of securities regulation

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<sup>2</sup> The Propensity to Corrupt measure is developed in Mironov (2015). This measure is built based on traffic violations of Muscovites for the 1997 to 2007 period and allows inferring propensity to pay bribes to the traffic police.

(LaPorta et al. 1997). We use a unique database of corporate theft that we create based on payments made by companies to “fly-by-night” entities with the intention of having the diverted money be returned fraudulently to owners or managers of companies in Russia. These fly-by-night companies, which we refer to as “*Spacemen*” (following the common term used for such companies in Russia), are shell companies created fraudulently for the purpose of receiving payments for fake services; the payments are then returned to the owners or managers of the companies making the payments.<sup>3</sup> *Spacemen* can be used both to divert income in order to enrich managers or owners and to increase expenses in order to evade taxes. In the first case, the fraud enriches managers at the expense of shareholders (or owner-managers at the expense of other shareholders) and in both cases illegally reduces taxes payable by the company. We use a number of databases to identify *Spacemen* and describe the identification methodology in detail in Appendix A. Primarily, we use data from the Russian Central Bank to identify payments to auditors and to various entities that we identify as *Spacemen*. Our sample consists of 25,824 companies, both public listed and private, with data from 1999 and 2003. As we describe later, the data source used for the study restricts our ability to expand the time frame to a more recent period.

We estimate that on average, 7.3 percent of revenues are diverted in our sample of Russian companies to fly-by-night entities. Russian firms that choose to be audited exhibit a lower level of income diversion. Of the entire sample, 3,256, or about 12 percent, of firms choose to be audited by a total of 264 auditors. Of the audited firm sample, about 13 percent are

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<sup>3</sup> Hermitage Capital, the largest foreign investment fund in Russia in 2004, provides the following example. In 2004, Gazprom3 bought pipes for \$700 million from the unknown company Trubny Torgovy Dom. This company was established in 2003 with only \$350 in charter capital, and it does not have a real address. Its CEO is impossible to locate, and market participants had never heard of the company (*Forbes*, 2006). Trubny Torgovy Dom is the 6th largest of the 99,925 *Spacemen* identified in the banking data.

audited by the Big 4 firms. Following convention, we consider PricewaterhouseCoopers (PwC), KPMG, Ernst & Young and Deloitte & Touche as comprising the Big 4 in Russia.

We find that audited firms divert less than non-audited firms; on average, audited firms divert 4.9 percent of revenues to fly-by-night entities. Big 4 auditors are associated with even lower diversion. In cross-sectional tests, we also find that audits in general and Big 4 audits are more effective in reducing income diversion in smaller companies than in larger ones. Along with the OLS estimations, we use propensity score matching on key observables (size, profitability, leverage, industry, etc.). We find that non-audited firms from the matched sample divert 5.7% of their revenue. The difference between audited and non-audited firm is 0.8%, statistically significant at 1%.

Our database also allows us to measure audit and non-audit related fees paid by clients. As expected, we find that the Big 4 charge higher audit fees in our sample than other auditors do after we control for other determinants of audit fees, such as firm size. Notably, audit fees to Big 4 auditors increase with the extent of income diversion to *Spacemen*. We find a similar pattern in non-audit fees: Big 4 auditors receive greater non-audit fees from clients, and non-audit fees to Big 4 auditors increase with the extent of diversion to *Spacemen* entities. This result may suggest that Big 4 auditors receive greater fees as an incentive from clients to ignore income diversion by managers. It can also reflect price protection by Big 4 auditors when they audit risky clients where they know they cannot detect and stop all income diversion. Next, using Mironov's (2015) methodology, we construct the PTC measure for auditors and their clients. We find that the management of audited companies is less corrupt than the management of non-audited companies. We also find that auditors' management is less corrupt than that of the companies in our sample. Big 4 auditors are less corrupt than non-Big 4 auditors. However, we document evidence that the Big 4 auditor corruptness is positively correlated with the corporate theft of their clients. In addition, the positive link between the fees paid to auditors and clients' corporate

theft is stronger for Big 4 auditors with high PTC. This empirical evidence provides support to the hypothesis that Big 4 auditors receive greater fees as an incentive from clients to ignore income diversion by managers.

Finally, we examine whether clients benefit when they subject themselves to an audit, especially by a Big 4 firm. Given that our sample firms are predominantly private companies, we examine cost of debt because we do not have data to measure the cost of equity for these firms. We find that interest costs increase with the extent of transfers to *Spacemen*; i.e., debt holders protect themselves with higher interest payments when they expect higher diversion in firms. Audited firms benefit from lower interest costs, and clients of Big 4 auditors benefit even more in terms of interest costs on their borrowings.

Our paper is different from the previous research on this topic in the following ways. First, we use an alternative to commonly used accrual accounting-based proxies for earnings quality (such as earnings management measures) to assess audit effectiveness. Lang et al. (2003) express concern that “constructs such as earnings management are notoriously difficult to measure” (page 385). Our measure of corporate theft captures a first-order issue in a number of countries where income diversion is an important concern and one that an auditor is expected to monitor. We thus add to the literature by examining an under-researched dimension of auditor effectiveness. Second, our analysis predominantly examines private firms, whereas the related literature widely focuses on public firms contained in cross-country datasets such as *Worldscope*. Third, we address the issues of the client demand for and the audit effectiveness of big-name auditors in a weak institutional environment. Our finding that auditing, especially by Big 4 auditors, constrains theft but does not eliminate it informs us of the effectiveness of auditing in a weak institutional setting. Moreover, our finding that Big 4 audited companies are rewarded by capital providers suggests that auditor reputation matters even in a low-litigation environment.

The rest of the paper proceeds as follows. In Section 2, we review the prior literature. In Section 3, we discuss the sample and present descriptive statistics. In Section 4, we discuss the empirical results, and in Section 5, we conclude.

## **2. Prior Literature**

Big 4 auditors (defined as the set comprising PwC, Arthur Andersen, Deloitte, KPMG and Ernst and Young and their predecessor firms) perform a dominant share of audits for publicly listed companies both in the U.S and internationally. Francis and Wang (2008) find that Big 4 auditors have over a 75 (50) percent market share in 26 (34) in 42 countries, with a low of 25 percent in the Philippines and a high of 100 percent in Kenya.

Companies are observed to appoint big-name auditors when doing so will reduce agency costs. Client demand might arise from the need to provide investors assurance on financial reporting quality. Fan and Wong (2005) find, in a sample of eight Southeast Asian countries, that firms with a greater extent of ownership problems inherent in their ownership structure were more likely to hire Big 5 audit firms. This is likely caused by demand from capital providers and other stakeholders for high-quality audits to serve as a substitute for weak public institutions. Thus, it is unsurprising that big audit firms have larger market shares than other auditors in countries with weaker institutions, though their share is lower than it is in countries with stronger institutions. Lennox (2005) suggests that unlisted companies that are not subject to monitoring by capital markets intermediaries (such as equity analysts) and are subject to weaker disclosure requirements may exhibit a greater need for higher-quality auditors. Managers in such companies may appoint brand name auditors, such as the Big 4, to communicate their bonding to a higher-quality reporting regime.

Watts and Zimmerman (1986) conjecture that larger audit firms provide better audits due to their greater monitoring ability. Prior research on U.S. companies finds that Big 4 auditors

provide higher audit quality than other firms. Teoh and Wong (1993) find a higher earnings response coefficient to earnings audited by big-name audit firms than other auditors. Balvers et al. (1988) and Beatty (1989) find that the use of a big-name auditor is associated with lower IPO underpricing. Mansi et al. (2004) find that bigger auditors are associated with lower debt pricing in client firms. Lawrence et al. (2011) suggest that the differences in audit quality are a reflection of client characteristics such as firm size, implying a selection bias in the samples used in prior papers; however, DeFond et al. (2016) dispute this claim by showing that Lawrence et al.'s results are driven by specific research design choices made in their paper.

The higher audit quality of big audit firms is considered a result of one or both of two factors: larger auditors desire to maintain their high-quality reputation (DeAngelo 1981), and larger auditors have incentives to avoid legal risk and consequent financial liability (Dye 1993). DeAngelo (1981) presents an agency theory-based framework in which large audit firms invest in audit technology to provide superior quality audits. These investments create large portfolios of clients that might leave the firm if audit weaknesses are discovered. The greater potential reputational harm motivates larger firms to continue to provide high-quality audits. Both reputational effects and litigation fears likely contribute to the effectiveness of Big 4 audits in the U.S.

In the international setting, the extent of legal liability for auditors varies significantly across countries (La Porta et al., 2006; Wingate 1997). Consequently, the supply of effective audits by Big 4 auditors is also observed to vary across countries. Demand for high-quality audits may be lower in countries with weak institutions for a few reasons. First, weak institutions foster opaque business environments that limit audit effectiveness. Second, the resulting limited demand for auditing reduces incentives for audit firms to develop audit expertise, which reduces their auditor credibility. Finally, in the absence of strong law enforcement, a negative audit has lesser value because it does not entail significant consequences for the firm or its managers.



Prior papers have considered audit fee premiums as a measure of the audit quality provided by Big 4 auditors. Craswell et al. (1995) and DeFond et al. (2000) document a Big 4 fee premium in Australia and Hong Kong, respectively. Choi et al. (2008), however, survey evidence from the U.K. and the U.S. and conclude that the evidence is mixed and does not conclusively show that Big 4 auditors command a fee premium in these two countries. Whatever the evidence in the four countries examined by this research indicates, all these countries are in the upper end in terms of investor protection and enforcement of securities laws. Evidence from these countries is unlikely to generalize to countries that do not share the effective institutional characteristics of these countries.

Evidence from cross-country studies can be more helpful. Choi et al. (2008) find that across countries, audit fees increase with the extent of legal liability for auditors. Furthermore, within a given legal liability, Big 4 auditors charge higher audit fees than non-Big 4 auditors. Finally, the Big 4 premium decreases as the legal liability strengthens. In contrast to this last piece of evidence in Choi et al. (2008), Francis and Wang (2008) find that the earnings quality of companies audited by a Big 4 auditor increases in stricter legal regimes but not for clients of non-Big 4 firms. However, given the differences in methodology between these papers, the reasons for the contrasting results are unclear. While these papers both suggest that the higher legal liability for auditors causes Big 4 auditors to provide better audit quality and charge more for it, the effectiveness of Big 4 auditors in countries with weak institutions is unclear. Our focus in this paper is on audit quality and fee difference in a country with weak institutional development and low legal liability for auditors.

Big 4 auditors can be motivated to provide high-quality audits even in the absence of litigation risk if they are motivated by reputational incentives. Weber et al. (2008) and Skinner and Srinivasan (2012) provide evidence from Germany and Japan, respectively, that audit clients defect from big-name auditors upon the revelation of audit quality weaknesses. This evidence is

consistent with reputational harm for big-name auditors following the discovery of audit weaknesses. Since Big 4 auditors have an international reputation to protect, they are more likely than domestic audit firms to provide higher-quality audits. Big firms possess international networks, and local offices draw on the expertise of the global network (Carson, 2009). However, even big audit firms are subject to the limitations of the institutional environments in which they perform their audits. A number of countries lack the infrastructure to support the professional development of auditors (Michas 2011). While Japan and Germany have low auditor litigation risk, they are among the most developed countries in the world. This leaves open the question of reputational incentives in countries lower on the institutional development scale, which is a question we explore in this paper.

### **3. Data and Descriptive Statistics**

We construct our test and control variables from a few databases from Russia. Corporate financial data are from Rosstat, the official Russian statistical agency. This database contains information about a company's identification number, name, address, date of incorporation, industry, directors, owners, and basic accounting data such as revenue, net income, assets, and liability. While the number of financial statement items is limited, the universe of companies covered is extensive, as all Russian firms must report their balance sheet and income statements to Rosstat on a quarterly basis. Rosstat thus contains accounting data for about 1.5 million Russian firms. Using Rosstat data, we select all audit firms with revenue greater than \$100,000 in 2003, which results in a sample of 264 auditors.

We also use banking data from the Russian Central Bank; these data have been used previously in Mironov (2013) and are available from a number of vendors in Russia.<sup>4</sup> The

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<sup>4</sup> These data can be purchased from several websites, including [www.mos-inform.com](http://www.mos-inform.com), [www.specsoft.info](http://www.specsoft.info), [www.wmbase.com](http://www.wmbase.com), and [www.rusbd.com](http://www.rusbd.com). Our data are purchased from [www.vivedata.com](http://www.vivedata.com).

banking data consist of 513,169,660 transactions involving 1,721,914 million business and government entities, and they contain information on the date of the transaction as well as its payer, recipient, amount and purpose. The data include only transactions that took place within Russia and do not include transactions in foreign currency, cash deposits or cash withdrawals.<sup>5</sup> We select all transactions where the payment is to one of the sample audit firms and the purpose is indicated as payments to auditors. We classify a transaction as a payment for audit services if its description contains the word “audit”. All other fees to auditors (e.g., payments for consulting) are classified as other fees to auditors. Russian company law requires that annual accounting statements (unaudited) be submitted to authorities no later than March 31 of the following year. Auditing procedures typically take place in the year when the filing is required and often after the unaudited results are filed. Therefore, we assign audit payments in time with a 1 year lag; e.g., payments made from January 1, 2000 to December 31, 2000 are assigned as audit payments for 1999 accounting statements. Since the banking data cover the 1999 to 2004 period, we can identify audit payments for 1999-2003. Payments for auditing 2004 statements cannot be identified since an audit of 2004 cannot be done until 2005, and we do not have banking transactions for 2005.

We select from Rosstat all companies that have revenue greater than \$1,000,000. We impose this restriction because audit services are typically required only by relatively large companies. Since we cannot be sure that the banking data provide the complete set of transactions for every firm, we choose only firms whose reported revenue is relatively close to their turnover from the banking data. Specifically, we include firms for which  $|\log(\text{revenue})-$

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<sup>5</sup> The data for were obtained from [www.rusbd.com](http://www.rusbd.com). The transactions range from very large to tiny. For example, the data show that on January 26, 2004, Gaztaged, a 100% subsidiary of Gazprom, paid 538 million rubles (\$18 million) to Trubny Torgovy Dom for pipes. In contrast, Rosneft, the largest oil company in Russia, paid its rental fee for a water cooler of 637 rubles (\$21) on July 9, 2003, to Selivanovskaya Voda. For a detailed description of these data and validity checks, see Mironov (2013).

$\log((\text{cash inflow} + \text{cash outflow})/2) < 1$ , where revenue is the company's total revenue for a given year (1999-2003) taken from Rosstat; cash inflow and cash outflow are the company's cash receipts and payments for this year, which are obtained from the banking data.<sup>6</sup> This yields a sample of 51,815 company years.

We identify transfers to *Spacemen* using the banking data. Intuitively, *Spacemen* are firms that do not pay taxes despite having transactions that would normally require taxes to be paid. More precisely, 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 216 rubles (\$7.2) in social security tax per month, which approximately corresponds to the minimum wage in Russia;<sup>7</sup> and (c) the firm's cash inflows are higher than its outflows. According to the Russian tax system, even a loss-making firm must pay value added tax, social security tax, and property taxes; hence, these criteria guarantee that such a firm cannot survive even a simple examination by tax authorities. We identify 99,925 *Spacemen* in the banking transaction data. More details of the identification of *Spacemen* and our efforts to check the reliability of our identification approach are provided in Appendix A.

Next, we construct a measure of income diversion at the firm level:

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

We report sample summary statistics in Table 1. Panel A statistics show that 11.26% of companies are audited, and 1.51% are audited by Big 4 accounting firms. Panel B presents summary statistics for the sample of audited firms. Among audited firms, 13.2% are clients of Big 4 auditors. The average audit (non-audit) fee in the sample is \$31,630 (\$18,240). Table 2 presents descriptive statistics for the top 20 audit firms in the sample. The Big 4 audit firms

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<sup>6</sup> The empirical results are robust to different cut-off points (0.5, 0.75, 2)

<sup>7</sup> In 2003-2004, the official minimum wage in Russia was 600 rubles (\$20).

derive the highest average fees from their clients. Consistent with the large international presence of these audit networks, they are also among the largest by number of clients, though some of the other audit firms have more clients than Deloitte (which is the smallest of the Big 4 in Russia, as measured by the number of clients).

## 4. Empirical Results

We present below the results of multivariate regressions on the relationship between auditing and income diversion. We also examine the relationship between income diversion by clients and audit fees. Finally, we analyze the relationships among cost of debt, income diversion, and auditing to examine the consequences of income diversion and auditing.

### 4.1 Auditing and Income Diversion

Our first set of tests examines whether firms that are audited are less likely to engage in income diversion using the following empirical specification:

$$ShadowR_t^i = \alpha + \beta_1 audited_t^i + \beta_2 Big4_t^i + \gamma Controls_t^i + \theta_t + \varepsilon_t^i$$

where  $i$  and  $t$  are firm and time indexes,  $ShadowR_t^i$  is the income diversion measure defined above,  $audited_t^i$  is a dummy for whether a company's financial statements were audited,  $Big4_t^i$  is a dummy for whether a company's financial statements were audited by a Big 4 firm,  $Controls_t^i$  is a set of firm-level controls,  $\theta_t$  are year fixed effects, and  $\varepsilon_t^i$  is the error term. Our control variables include firm size, measured by the log of revenues of the firm ( $Log(Revenue)$ ); firm profitability, measured by earnings before taxes scaled by total assets ( $EBT/Assets$ ); leverage, measured as debt scaled by total assets of the firm ( $Debt/Assets$ ); and whether the firm is controlled by the government ( $Gov Control$ ). We include the extent of inventories and receivables in the firm scaled by total assets ( $InvRec$ ) as a measure of complexity facing the audit

task, following Choi et al. (2009). *Loss* measures whether the firm makes a loss in that fiscal year. Finally, we include two measures of ownership: *CEO\_Owner* measures whether the CEO is the owner of the firm, and *N\_Owners* measures the number of shareholders. We consider these two as governance variables that can impact the extent of income diversion in the firm. All variables are defined in Appendix B.

Panel A of Table 3 presents the results of the above estimation. All standard errors are clustered at the firm level, and all specifications include dummy variables to control for industry, the region in which the firm is located, and year. Column 1 presents the results using the entire sample, and Columns 2 and 3 present the results for the sample of audited firms. Column 1 results show that audited companies transfer to *Spacemen* 0.68% less revenue than companies that do not subject themselves to an audit (note that the mean and median of *ShadowR* are 7.8% and 2.5%, respectively, from Table 1). The coefficient estimate is significant at the 1% level. In Column 2, we find that within the sample of audited firms, Big 4 audits are associated with a lower diversion of funds. Big 4 auditors are associated with a 1.19% lower transfer to *Spacemen*. In Column 3, we proxy for auditor reputation using the revenue of an auditor in 2003 as a measure of auditor size; we conjecture that larger auditors ascribe greater value to their reputation. More reputable auditors attract more clients. Furthermore, larger auditors risk losing more in cases of fraud among their clients, which provides them with greater incentives to care about their reputation. We find that the coefficient for log (revenue of auditors) is negative and statistically significant. Overall, the results show that firms that choose to be audited, especially those that choose a Big 4 audit firm, exhibit a lower extent of diversion of corporate funds.

The control variables also provide some interesting insights. Firms that divert less are larger, are more profitable, have greater leverage (likely reflecting greater monitoring by debt holders), are government controlled, are loss-making firms, and have a greater number of

shareholders. Firms that have more inventories and receivables (and thus are likely more complex to audit), and those with a CEO owner are more likely to divert funds out of the firm.

In addition to the OLS estimates, we use propensity score matching on all key observables (see Panel B of Table 3). Specifically, we compare firms that are similar in size, profitability, debt financing, industry, and other characteristics. We can observe from the table results that the estimations are not significantly different from the OLS estimations. Audited firms divert 0.79% less revenue than non-audited ones. Firms audited by Big 4 divert 0.71% less revenue than firms audited by non-Big 4 auditors.

We recognize the endogenous relationships among the type of firm, the choice to be audited and the type of auditor (Big 4 or smaller auditor) that the firm chooses to hire. For instance, firms with better internal governance are likely to both choose to be audited and divert fewer corporate resources for private use. Although we conduct an analysis based on a propensity score-matched sample, we recognize that endogeneity might still be an issue to consider. To take into account such a possibility, we conduct a two-stage regression (untabulated). The first stage estimates the propensity of a firm to be audited. We find that firms that are larger, government controlled, and loss-making entities and those with many owners are more likely to be audited. Firms that have a greater proportion of inventories and receivables (and hence are more complex and likely costlier to audit) and those with a CEO owner are less likely to be audited. We then conduct a second-stage model after including the Inverse Mills Ratio from the first-stage regression. We find that the inferences are unchanged compared to those in Table 3: firms that are audited divert fewer resources away from the firm. We also examine the choice to be audited by a Big 4 auditor within the sample of firms that are audited. The results show that firms that are larger, are more profitable, have higher leverage, and are loss-making are more likely to choose a Big 4 audit firm. Firms that are government controlled, have more complex auditing requirements (*InvRec*) and have CEO owners are less likely to hire

a Big 4 audit firm. We then include the Inverse Mills Ratio from this first stage to control for the firm's choice to hire a Big 4 audit firm. The inferences after the inclusion of the Inverse Mills ratio remain similar to those made based on Table 3 estimates: firms with Big 4 auditors transfer fewer funds out of the company. The magnitude of this effect is 1.27%. Therefore, the relationship between income diversion and auditing (and Big 4 audit) continues to hold after we take into account firms' choice to be audited and their choice of auditor to hire.

Although our empirical evidence suggests that audited firms divert significantly less than non-audited ones, we do not claim that this relationship is casual. Most likely, our findings provide support for the signaling hypothesis. Good firms are willing to signal their quality to potential investors and partners by hiring reputable auditors. The auditors just "stamp" their quality.

#### ***4.2 Role of intermediating factors in income diversion and auditing***

While the above analysis shows that auditing, especially by the Big 4 auditors, is associated with lower income diversion, we are also interested in understanding when auditors (Big 4) have a greater impact. We therefore examine cross-sectional differences in the impact of auditing on income diversion arising from four measures that we used as control variables in the previous regression: firm size, government control of the firm, whether the CEO is the owner and the number of shareholders. We repeat the same analysis for the choice of Big 4 auditors.

The results of the above analysis are presented in Table 4. Panel A presents the results for the association between income diversion and auditing, and Panel B considers the choice of Big 4 auditors. Panel A results show a positive and significant coefficient in four of the five interaction terms: firm size (*log Revenue*), government control, number of shareholders, and debt financing. This suggests that auditing has a greater impact in smaller firms, where the firm is not controlled by the government, when there are few shareholders, and when the debt is lower.



Panel B results show that Big 4 auditors are more effective in smaller firms, mirroring the results for firm size in Panel A. Big 4 auditors are also associated with lower income diversion when the CEO is not the owner.

### **4.3 Audit Fees and Income Diversion**

While auditors are expected to prevent diversion of resources for private benefit, clients that are keen on diverting funds may co-opt auditors by providing them with excess audit fees. Long-standing concerns about auditor independence have led to requirements to disclose fees for non-audit services in the U.S. and elsewhere (Koh et al., 2012) and the ban on auditor-provided consulting services in the Sarbanes-Oxley Act of 2002. Therefore, we examine the relationship between audit fees and income diversion. Ex ante, the extent of income diversion can be positively or negatively related to the extent of audit fees. Under a corrupt auditor hypothesis, auditors are aware of the income diversion but do not prevent it because they are bribed by the manager with higher audit fees. Additionally, auditors take greater reputational risk when they agree to audit companies with a greater level of income diversion, and they can compensate themselves for the higher risk and cost of detection with higher audit fees. On the other hand, managers may enable income diversion by lowering auditor effort by paying less for the audit. Auditors who are not paid commensurate with the level of work required do not spend enough on audit scrutiny and are therefore less likely to detect income diversion by managers. To test this hypothesis, we use fees from both audit and non-audit services paid by clients and estimate the following regressions:

$$\begin{aligned} \text{Log}(\text{Audit Fees}_t^i) &= \alpha + \beta_1 \text{Big4}_t^i + \beta_2 \text{ShadowR}_t^i + \beta_3 \text{ShadowR}_t^i \cdot \text{Big4}_t^i + \delta \text{Controls}_t^i + \theta_t + \varepsilon_t^i \\ \text{Log}(\text{Other Fees}_t^i) &= \alpha + \beta_1 \text{Big4}_t^i + \beta_2 \text{ShadowR}_t^i + \beta_3 \text{ShadowR}_t^i \cdot \text{Big4}_t^i + \delta \text{Controls}_t^i + \theta_t + \varepsilon_t^i \end{aligned}$$

where  $i$  and  $t$  are firm and time indexes,  $\text{ShadowR}_t^i$  is the income diversion measure defined above,  $\text{Audit Fees}_t^i$  are audit fees paid to auditors,  $\text{Other Fees}_t^i$  are other fees paid to auditors,

$Big4_t^i$  is a dummy for whether a company's financial statements were audited by a Big 4 firm,  $Controls_t^i$  is a set of firm-level controls,  $\theta_t$  are year fixed effects, and  $\varepsilon_t^i$  is the error term.

We report the results of the above estimation in Table 5. The sample consists of all audited firms only. Panel A reports the regression results with audit fees as the dependent variable, and Panel B reports results with non-audit fees as the dependent variable. The Panel A, Column (1) results show that Big 4 auditors receive 144 percent higher audit fees than other audit firms even after we control for client firm size, profitability and other factors that prior research has found to be related to audit fees (Choi et al., 2009, Minnis 2011). This result confirms the Big 4 audit fee premium result documented in prior literature (DeFond et al., 2000).

Estimates on the control variables show that a longer auditor tenure is associated with higher audit fees. Larger audit firms (*Big 4*) receive greater audit fees, and larger clients pay higher fees, as observed on the positive and significant coefficient on the *Log (Revenue)* term. Loss-making firms paying higher audit fees. In the results of Column (2), we examine whether audit fees are associated with transfers to *Spacemen*. The lack of a significant coefficient on *ShadowR* suggests that on average, audit fees are not associated with greater funds diversion.

In Column (3), we examine the relationship between Big 4 auditors and income diversion. The variable of interest is the interaction between Big 4 auditors and *ShadowR*. The coefficient on the interaction term *ShadowR\*Big4* ( $\beta_3$ ) is positive and statistically significant, suggesting that Big 4 auditors are paid more when their clients divert more funds out of the firm. The effect is also economically significant. A one standard deviation increase in income diversion corresponds to an approximately 8.7 percent increase in audit fees. While the results suggest that the Big 4 receive higher audit fees when income diversion increases, the essence of this relation is not obvious. One possibility is that the higher fees reflect price protection for greater risk on the part of the Big 4 auditors. Another possibility is that they represent fees to

look the other way when executives divert funds out of the firm. Surprisingly, only Big 4 auditors exhibit higher fees relating to income diversion in their fees. We find no statistically significant effect of income diversion on audits for non-Big 4. The Big 4 effect remains similar when we do not include the main effect and only include the interaction in Column (4).

Given the concerns about the provision of non-audit services and the potential for auditors' loss of independence arising from non-audit fees, we examine the relationship between income diversion and non-audit fees. The results are presented in Panel B, where the dependent variable is Log of other (non-audit) fees paid to the auditors. The inferences from these results broadly mirror the inferences from the audit fee regressions. Column (1) results show that Big 4 auditors receive a significantly greater extent of non-audit fees, which likely reflects their ability to provide a greater extent of non-audit services. Column (2) results show that non-audit fees are not related to the extent of income diversion in the client firms. However, Column (3) results show that Big 4 auditors receive greater non-audit fees when their clients divert more income out of the firm; this economic effect is even more significant than in the case of audit fees. A one standard deviation increase in income diversion corresponds to a 24.2 percent increase in non-audit fees. The same effect remains in Column (4) when we drop the main effect of transfer to *Spacemen*/revenue and include only the interaction effect. As in the case of audit fees, we cannot distinguish between non-audit fees paid for a greater risk of auditing risky clients and those for auditors looking the other way. However, it is interesting that the premium exists only for Big 4 auditors and not for other auditors. The results show that clients that divert income out of the firm pay a cost in terms of excess audit fees when they have Big 4 auditors but do not need to do so for non-Big 4 auditors.

It is worth noting that audit and non-audit fee information is not publicly disclosed in Russia. We are able to gather this information based on the banking data that we described earlier. Therefore, the relationships we observe between audit fees and income diversion cannot

normally be observed outside the firm. The salutary effect of public scrutiny related to audit fees on auditor monitoring caused the SEC to demand disclosure of audit and non-audit fees in the U.S. in 2000. The absence of public information about audit fees in Russia likely reduces the disciplinary effect on auditors.

#### ***4.4 Auditor Corruption and Income Diversion***

In the previous section, we discussed two factors that can lead to higher audit fees in the presence of income diversion: (1) auditors charge higher premium because of the higher risk from potential enforcement or the reputational costs of being associated with diverting firms, or (2) the auditor partners and other senior employees who turn a blind eye to the income diversion are themselves enriched by the higher audit and consulting fees. This latter rationale is more likely in the presence of corrupt auditors. While it is hard to test these two possibilities directly, we employ an indirect method using the propensity to corrupt (PTC) measure, developed in Mironov (2015). This measure is built based on traffic violations of Muscovites for the 1997 to 2007 period. Drivers occasionally commit traffic violations. However, not all traffic violations are recorded. A driver who is stopped by police can often avoid a formal penalty in exchange for a bribe. Therefore, observing a person's recorded traffic violations for a long period of time allows an inference of individual PTC, which is measured by the difference between the number of expected and actual traffic violations for this person. The higher this difference, the higher the person's PTC.

Table 6 Panel A provides descriptive statistics of PTC. The PTC of top management (PTC Top 5) of non-audited firms is 4.29, which is higher than PTC of audited firms (not by Big 4) at 4.21. Firms audited by the Big 4 have even lower PTC, 4.08. All differences are significant at the 1% level. This implies that audited firms have less corrupt management than firms that are not audited and those that are audited by Big 4 have less corrupt management than non-Big 4

audited firms. Note also that the PTC of auditors, 3.94, is lower than the PTC of other firms. Non-Big 4 auditors have a higher PTC than Big 4 auditors (4.03 vs. 3.46). The difference is significant at 1%. These statistics are consistent with the evidence that the management of audit firms is less corrupt than the management of other companies, and the management of Big 4 firms is less corrupt than the management of non-Big 4 auditors.

The results of Panel B, Table 6 demonstrate a positive link between audit fees and an interaction of auditor PTC and ShadowR for Big 4 auditors (see Column 2). The related coefficient is 0.63 and significant at the 10% level. The link between other fees paid to auditors and the interaction of auditor PTC and ShadowR for Big 4 auditors is even stronger (see Column 4). The related coefficient is 9.82 and significant at the 1% level. This means that the greater the corruptness of the auditor, the stronger the link between the fees paid to the auditor and the income diversion of the client. As a corruptness measure, Panel B uses the average PTC of the top 25% best paid auditor employees.

Panel C employs the average PTC of the 75% lowest paid employees as the measure of auditor corruptness. The idea behind this “placebo” test is that only the senior auditors (the highest paid ones) are engaged in negotiations with clients, and the PTC of the lowest paid employees should not affect the fees charged by the auditors. As observed from Column (2), the coefficient for auditor PTC and ShadowR for Big 4 becomes negative and insignificant. However, the same coefficient in Column (4) is significant at 10% even though it is much smaller than the same coefficient in Panel B. This positive and significant correlation might be explained by a positive correlation between PTC in the top 25% and PTC in the bottom 75% (0.59 for Big 4 auditors, 0.12 for other auditors). It is likely that more corrupt management prefers to hire corrupt employees, and this could explain the statistical significance of the coefficient in Column (4).

To summarize, the positive link between the fees paid to auditors and the accounting manipulation of their client is explained by the auditors' PTC. Moreover, corrupt auditors prefer to charge their "extra" fees through consulting rather than auditing fees. The related coefficient for "other fees" is 15 times higher than that for audit fees (see Column 4 of Panel B vs. column 2 of Panel B).

Panel D of Table 6 shows the relations among income diversion, firm PTC and auditor PTC. Column (1) demonstrates a positive correlation between income diversion and the corruptness of firms' management. Column (2) shows that the clients of Big 4 auditors with a higher PTC exhibit a higher income diversion. However, when we add Firm PTC and Auditor PTC simultaneously (see Column 3), the coefficient for the interaction of Big4\*Auditor PTC becomes statistically insignificant (significant at the 14% level). The possible reason might be a 30% drop in the number of observations from Column (2) to Column (3). The PTC measure is available only for Moscow firms (auditors), so including PTC in the regressions means eliminating firms (auditors) from all regions but Moscow. The coefficient for firm PTC is positive and significant in both Column (1) and Column (3). The results of Columns (4) and (5) indicate the absence of a significant interaction effect of firm PTC and auditor PTC on income diversion.

#### ***4.5 Audit Effort, Income Diversion and Cost of Capital***

The results from Sections 4.1 to 4.3 suggest that firms that are audited, especially those that are audited by Big 4 audit firms, divert less income out of the firm. Furthermore, the results in Section 4.4. show that the propensity for auditor corruption is related to income diversion and higher audit fees.

However, the association between audit fees and greater income diversion is consistent with the evidence that Big 4 auditors price protect themselves for the risk of auditing firms that

have greater income diversion and that firms pay more to audit firms to co-opt the auditor into the income diversion scheme. In combination, these two results suggest that while auditing, especially by a reputed auditor, is associated with lesser income diversion, such reputed auditors also receive higher fees when they audit income-diverting firms. This second result is surprising to the extent that some of the increased audit fees are to compensate the audit firm for the risk of associating with an income-diverting firm. This suggests that firms expect to receive some benefit from being audited by a reputed auditor.

We examine whether income-diverting firms receive any benefit in their cost of capital when they are clients of more reputed auditors. Since most firms in the sample are private firms, we are unable to develop measures of cost of equity. We therefore examine their cost of debt by estimating the following regression:

$$Debt\ Interest\ Rate_t^i = \alpha + \beta_1 audited_{t-1}^i + \beta_2 Big4_{t-1}^i + \gamma Controls_t^i + \theta_t + \varepsilon_t^i$$

where  $i$  and  $t$  are firm and time indexes, *Debt Interest Rate* is an average interest rate paid on a company's debt, *Audited* is an indicator variable identifying whether the company's financial statements are audited, and *Big 4* is an indicator variable identifying whether the company's financial statements are audited by a Big 4 audit firm. *Controls* are the same set of firm-level controls as in the previous regressions,  $\theta$  are year fixed effects, and  $\varepsilon$  is the error term. We lag the auditor indicator variables by one year because in year  $t$ , banks can observe only whether a company has an audited statement for year  $t-1$ .

We report the results of the above estimation in Table 7. Column (1) results show that firms that are audited pay a lower cost of debt (64 basis points) than firms that are not audited. In Column (2), we add an interaction between *ShadowR* and *Audited* to examine whether the interest cost varies for audited firms when there is greater income diversion. The coefficient on *ShadowR\*Audited* is insignificant, showing no such effect. In Column (3), we distinguish

auditors as Big 4 auditors or others. Column (3) results show that the debt cost benefit is enjoyed only by firms that are audited by the Big 4 audit firms; the coefficient for *Big 4* is negative and statistically significant at the 1% level. Companies that are audited by the Big 4 audit firms pay on average 221 basis points less interest on their debt than companies that are not. The coefficient for *Audited* is negative but statistically insignificant. Columns (5) to (7) present the results within the sample of audited firms. The results in Column (5) confirm Column (3) results, which indicate that clients of Big 4 auditors have lower interest costs than clients of other auditors. The magnitude (196 basis points) is similar to that in Column (3) estimates. In Column (6), we include an interaction between *ShadowR* and *Big 4*. As in Column (2), the coefficient on *ShadowR \*Big 4* is insignificant. In Column (7), we replicate Column (5) results but by substituting the Big 4 measure with a continuous measure of auditor revenues. The inferences remain unchanged: consistent with previous results, we find a negative and significant coefficient on auditor size, as the interest cost for clients decreases with auditor size.

The estimates in Columns (1) to (4) also show that interest costs increase with the extent of income diversion (coefficient on *Shadow R* is positive and significant). However, we do not observe the same within the sample of audited firms. This suggests that the greater cost is a function of a lack of auditing, and the Big 4 do not incrementally change the impact on debt cost; this result is consistent with the lack of significance of the interaction term noted above.

Overall, the results in Table 7 suggest that more reputed Big 4 auditors are associated with a lower cost of capital for their clients. This potentially explains why clients, even those that engage in income diversion, hire reputed auditors and pay them a price premium.

## 5. Conclusions

We examine the relationship between auditing and corporate theft from companies in Russia using a novel database of diversion of funds from companies that we created. We find



that companies that choose to be audited exhibit a lower extent of income diversion. This is especially true for firms that are audited by the Big 4 audit firms. Both the audit and non-audit fees of Big 4 auditors are higher when their clients are observed to divert more. This could reflect one or both of the following possibilities. While Big 4 auditors can prevent some diversion, they cannot eliminate it. Therefore, Big 4 auditors, which have the most to lose with a tainted reputation, price protect themselves when they audit risky clients. The more pernicious possibility is that clients that divert resources out of the firm pay their auditors more to look the other way when they steal from their firms. Our data provide some support in favor of the latter hypothesis. The higher the auditor corruptness, the higher the income diversion of their clients and the stronger the positive link between auditor fees and corporate theft. Finally, we find that cost of capital is lower for firms that are audited by Big 4 auditors, providing a rationale for why income-diverting firms would still choose to be audited by a Big 4 despite the constraints that the better auditor places on the extent of funds diversion.

Overall, our findings provide evidence on the valuable role of auditing, especially by a Big 4 auditor, even in an economy characterized by weak investor protection and poor law enforcement. It also demonstrates the limits of auditing, even by reputed auditors, in preventing theft from companies in low-quality institutional environments. Even the biggest audit firms do not eliminate or significantly reduce income diversion from companies.

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## Appendix A – Identification of Spacemen

We discuss here how we identify *Spacemen* entities and estimate diversion of funds from companies to fly-by-night entities. The income diversion schemes typically involve the artificial inflation of expenses through fake contracts. For example, firm A wants to evade \$X so it makes a deal with firm B to render goods or services of value of \$100, but 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. Firm B, referred to as a *Spaceman*, comes from seemingly nowhere, does not perform any real activities, pays almost no taxes, and disappears ("flies into space") in a short period of time. This type of firm is also called a "dump," "flashlight," "bruise," "hedgehog," "fly-by-night company," or a "one-day-company." According to Sergei Arkelov, the deputy head of the Federal Tax Service, spacemen generally do not submit accounting statements to authorities (Interfax, 2011). Diversion of corporate funds using spacemen often involves long chain of transactions, with each transaction appearing to be legitimate. Spacemen are typically registered in the names of homeless people or persons whose identification has been lost or stolen. Spacemen are also often registered in the names of people who sell their identification data. We found during our interviews with business executives in Moscow that in 2003 to 2004, the costs of creating a new *Spaceman* were about \$350 to \$500, and law firms that specialize in registering new businesses often sell *Spacemen* that are already registered.

Because \$X can be large and is usually paid in cash, *Spaceman* schemes require the collaboration of bank officials. As the Wall Street Journal reports, "In the West, most business payments are made by bank transfer, and cash withdrawals of even a few thousand dollars can raise eyebrows. In Russia, cash is king. Companies—both criminal and outwardly legitimate—often use it to pay salaries, and so avoid onerous payroll taxes... To get their hands on that

money, businesses must navigate strict rules barring banks from dispensing large amounts of cash. Luckily for them there are dozens of small, fly-by-night banks ready to use legal loopholes—and panoply of complex financial scams—to get around the rules. For the banks, which charge fees of as much as 5% for customers to withdraw cash, it is a lucrative business.” (Wall Street Journal 2006).

Income diversion can be used to save on taxes as well as to divert funds for personal use by managers or owners. How much do companies save in taxes from spaceman schemes? Consider the case of a company that transfers \$100 to a spaceman for fake services, and this money is returned to the company’s owner. The spaceman provides an invoice for \$84.75 (services) + \$15.25 (VAT, 18%), totaling \$100. The company can then decrease its total VAT payment by \$15.25 (VAT already “paid” by the spaceman). Next, the company is allowed to decrease its taxable income by \$84.75 (the cost of “services” provided by the spaceman), which yields a profit tax savings equal to \$20.34 ( $=\$84.75 \times 24\%$  (the profit tax rate)). If the company had paid all appropriate taxes on the \$100, the amount left for the company to return to its owner would be \$64.41, not \$100. Further, if the company paid \$64.41 as a dividend, the owner would have to pay a dividend tax of \$5.80 ( $\$64.41 \times 9\%$  (the dividend tax rate)). Thus, if a firm uses a spaceman to hide its \$100 profit, then the total tax evasion would be \$41.39 ( $\$15.25 + \$20.34 + \$5.80$ ), or 41.39% of the money transferred to the spaceman. Another popular way of using spacemen money is payment of an under-the-table salary, thereby avoiding payroll taxes. In this case, companies evade social security tax (30.4%), VAT (18%), and personal income tax (13%). Thus, the total tax savings is 49.51% of the money transferred to the spacemen. Finally, a company might use money transferred to spacemen to pay cash expenses because some suppliers, especially small businesses, offer substantial discounts for cash payments, which allow the suppliers to hide these cash receipts from the tax authorities. By using

spacemen money to pay cash expenses, a firm evades VAT on the amount of VAT paid by spacemen.

The same schemes can be used not only for tax evasion but also for managerial diversion. William Browder, CEO of Hermitage, believes that “Gazprom [is] destroying shareholder value through ...the increased use of secretive intermediaries, whose relationships with the company remained unknown.” (The Times, 2005). Many executives that we interviewed agree that large companies use spacemen primarily for managerial diversion rather than for tax evasion. Indeed, if a manager transfers some of the firm’s profits to spacemen, then these profits are hidden not only from the government but also from minority investors.

Empirically, the spacemen are identified as firms that pay no or negligible taxes. Using the banking data, we consider any transfer to a tax collection agency as a tax payment.<sup>8</sup> 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 216 rubles (\$7.2) in SST per month, which corresponds to one minimum wage;<sup>9</sup> and (c) the firm's cash inflows are higher than its outflows. In Russia, even a loss making firm must pay VAT, SST, and property taxes; hence, these criteria guarantee that such a firm cannot survive even a simple examination by tax authorities. A firm's gross tax rate is defined as

$$gross\ tax\ rate = \frac{tax\ paid}{(cash\ inflow + cash\ outflow) / 2}$$

Because the price for *Spaceman* services in 2003 started as low as 1%, the nature of their business prevents such firms from paying taxes that are higher than 1% of average turnover. Therefore, a firm is classified as *regular* if it has a gross tax rate of more than 1%; firms with tax

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<sup>8</sup> This potentially leads to an overestimation of a firm's tax burden. For example, if a local tax office sublets part of its building to a cafe, then each rental payment made by the cafe will be treated as a tax payment.

<sup>9</sup> In 2003 to 2004, the official minimum wage in Russia was 600 rubles (\$20).

rates between 0.1% and 1% represent a mix of *Spacemen* and regular firms and therefore are not attributed to either class.

We triangulate the *Spacemen* identification method in a few ways. The monthly turnover of a *Spaceman* is over 2.5 times greater than that of a regular firm (\$641,535 versus \$251,247) but performs 40% fewer transactions (25 versus 42); therefore, an average *Spaceman* transaction is 4.3 times higher than an average regular firm transaction. Furthermore, a *Spaceman* exists almost 200 days fewer than a regular firm (391 days versus 588 days), where firm age is defined as the date of the last transaction minus the date of the first transaction in the sample.

Next, the data on *Spacemen* and regular firms are matched to Rosstat – Russian official statistical agency. The results of this match indicate that 43.4% of spacemen are not found in the Rosstat database (i.e., they never provided any reports to Rosstat) as compared to 9.5% of regular firms. Only 34.7% of *Spacemen* reported positive revenue for 2003 or 2004. Of these 34.7% *Spacemen*, the average (median) *Spaceman* reported \$2,433K (\$9.3K) of revenue, even though its banking receipts were \$13,630K (\$2,630K). These statistics contrast with those of regular firms: 69.9% of regular firms reported positive revenue in 2003 or 2004. An average (median) regular firm reported \$3,586K (\$390K) of revenue, and it received \$2,866K (\$450K) of inflow in its bank account. Firm registry data indicate that *Spacemen* are often registered at a “mass registration” address i.e., an address at which many other companies are also registered; 69.9% of *Spacemen* are registered at addresses where at least 100 other firms are registered, and 28.4% of *Spacemen* are registered at addresses where at least 500 other firms are registered (for regular firms, the respective statistics are 38.6% and 14.3%). Identification data on 18.9% of *Spacemen* CEOs are present in the police database of lost and stolen identifications. According to the Moscow auto registry data, 17.8% of *Spacemen* CEOs own (or ever owned) a car, and 13.9% earned more than \$1 per day (\$365 per year). A person is defined as “poor” if he or she never owned a car and has income below \$1 per day. According to this definition, 73.7% of



*Spacemen* CEOs can be classified as poor. In comparison, the average CEO of a regular firm has a reported income that is four times higher than that of the average CEO of a *Spaceman* and is three times more likely to own a car.<sup>10</sup> The data for the owners of *Spacemen* exhibit a similar pattern. Compared to the owners of regular firms, an average *Spaceman* owner earns an income that is six times lower and is one-third as likely to own a car. Even though the CEOs and owners of *Spacemen* are much poorer than those of regular firms, the average receipts of *Spacemen* are about five times greater than those of regular firms (\$13,631K vs. \$2,866K). This evidence suggests that the nominal CEOs and owners of *Spacemen* are not the real ones.

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<sup>10</sup> Note that an average income is calculated only for persons with positive income. Because twice as many “regular” CEOs have positive income in 2002 than spaceman CEOs, the true difference in income between regular CEOs and spaceman CEOs is about eight times.

## Appendix B – Variable Descriptions

<i>Variable Name</i>	<i>Definition</i>	<i>Data Source</i>
<i>Revenue</i>	Fiscal year revenues	Rosstat
<i>Assets</i>	Total assets	Rosstat
<i>EBT</i>	Earnings before taxes	Rosstat
<i>Actual EBT</i>	Earnings before taxes corrected for hidden earnings	Rosstat
<i>Debt</i>	Sum of short term debt and long term debt	Rosstat
<i>Transfers to spacemen</i>	Transfers to "fly-by-night" entities estimated using the banking transaction database.	See Appendix A for details
<i>Debt interest rate</i>	Interest expenses divided by average Debt, i.e. Debt interest rate (t)=Interest expenses (t)/[(Debt (t)+Debt (t-1))/2], where t is year.	Rosstat
<i>Gov control</i>	Dummy variable that takes value 1 if the government owns more than 25% of the company	Rosstat
<i>Audited</i>	Dummy variable that equals 1 if a company made any payments to an audit firm for audit services during particular year, lagged by 1 year. e.g. Audited is equal to 1 for year 2000 if a company made payments for audit services during the period Jan 2001 – Dec 2001.	Banking transaction data
<i>Audited by Big 4</i>	Dummy variable that equals 1 if a company made payments to Big 4 accounting firm (PWC, KPMG, E&Y, and Deloitte) for audit services during particular year, lagged by 1 year.	Banking transaction data
<i>Audit fees</i>	Total audit fees paid to auditors for the year.	Banking transaction data
<i>Other fees to auditors</i>	Payments other than for audit services paid to auditors for the year.	Banking transaction data
<i>Auditor tenure</i>	Number of years of auditor service	Rosstat
<i>Revenue of auditor</i>	Auditor's revenues for 2003	Rosstat
<i>InvRec</i>	(Inventory + Accounts Receivable)/Assets	Rosstat
<i>Loss</i>	Dummy variable equal to 1 if EBT<0	
<i>Revenue growth</i>	Log(Revenue(t))-Log(Revenue(t-1))	
<i>CEO_Owner</i>	Dummy variable equal to 1 if firm's CEO is also one of the firm's owners in 2004.	Rosstat
<i>N_Owners</i>	Number of firms' shareholders in 2004.	Rosstat
<i>Current Ratio</i>	Current Assets/Current Liabilities	Rosstat
<i>PPE</i>	Property, plant, and equipment	Rosstat
<i>NegEquity</i>	Dummy variable equal to 1 if NetAssets < 0. NetAssets the difference between firm's assets and liabilities	Rosstat
<i>PTC</i>	Propensity to Corrupt	Mironov (2015)

Rosstat is acronym for Rossisky (Russian) Statistics, it is official Russian statistical agency (<http://www.gks.ru/>) which collects the detailed information about Russian firms. Data are available at Spark (spark.interfax.ru).

**Table 1: Summary Statistics**

The table presents summary statistics for the sample of 25,824 companies for 1999-2003 time period. Panel A presents statistics for entire sample. Panel B describes the sample of firms with audited financial statements. All variables are defined in Appendix B.

**Panel A: All firms**

	Mean	Median	St. dev.	N of obs	N of firms
	(1)	(2)	(3)	(4)	(5)
Revenue, \$000's	\$14,572	\$2,628	\$183,131	51815	25824
Assets, \$000's	\$18,073	\$1,029	\$535,567	51815	25824
EBT, \$000's	\$1,867	\$41	\$48,955	51815	25824
Actual EBT, \$000's	\$2,002	\$110	\$49,796	51815	25824
EBT / Assets, %	12.54	5.38	21.40	51815	25824
Actual EBT / Assets, %	30.51	11.74	76.98	51815	25824
Debt / Assets, %	15.49	0.01	25.46	51815	25824
Log(Revenue)	8.18	7.87	1.15	51815	25824
InvRec	0.60	0.66	0.27	51815	25824
PPE	0.17	0.07	0.22	51815	25824
Current Ratio	1.58	1.07	1.35	51815	25824
Loss, %	14.93	0.00	35.64	51815	25824
NegEquity, %	13.54	0.00	34.21	51815	25824
ShadowR	0.073	0.023	0.111	51815	25824
Debt interest rate	0.146	0.121	0.123	7437	4668
Gov Control, %	5.24	0.00	22.29	51815	25824
Ceo_owner, %	44.37	44.83	36.82	51815	25824
N_owners	2.80	2.76	3.64	51815	25824
Audited, %	11.26	0.00	31.61	51815	25824
Audited by Big 4, %	1.51	0.00	12.21	51815	25824
Audit fees, \$000's	\$3.56	\$0.00	\$85.90	51815	25824
Other fees to auditors, \$000's	\$2.06	\$0.00	\$73.81	51815	25824
Revenue of auditor in 2003, \$000's	\$1,120	\$0	\$9,207	51815	25824

**Panel B: Firms with audited financial statements**

	Mean	Median	St. dev.	N of obs	N of firms
	(1)	(2)	(3)	(4)	(5)
Revenue, \$000's	\$56,741	\$5,705	\$489,286	5834	3261
Assets, \$000's	\$87,959	\$4,041	\$1,404,511	5834	3261
EBT, \$000's	\$9,957	\$187	\$124,341	5834	3261
Actual EBT, \$000's	\$10,354	\$289	\$126,721	5834	3261
EBT / Assets, %	12.45	6.90	20.41	5834	3261
Actual EBT / Assets, %	18.17	10.36	39.31	5834	3261
Debt / Assets, %	16.86	2.54	25.36	5834	3261
Log(Revenue)	9.01	8.65	1.55	5834	3261
InvRec	0.51	0.52	0.28	5834	3261
PPE	0.24	0.15	0.25	5834	3261
Current Ratio	1.65	1.14	1.39	5834	3261
Loss, %	16.25	0.00	36.89	5834	3261
NegEquity, %	12.08	0.00	32.60	5834	3261
ShadowR	0.049	0.016	0.084	5834	3261
Debt interest rate	0.129	0.101	0.119	1401	905
Gov Control, %	9.92	0.00	29.90	5834	3261
CEO_Owner, %	33.42	44.83	35.55	5834	3261
N_Owners	3.02	2.76	5.86	5834	3261
Audited by Big 4, %	13.20	0.00	33.85	5834	3261
Audit fees, \$000's	\$31.63	\$5.23	\$254.28	5834	3261
Other fees to auditors, \$000's	\$18.24	\$0.00	\$219.30	5834	3261
Revenue of auditor in 2003, \$000's	\$9,822	\$781	\$25,677	5834	3261
Auditor tenure, years	1.63	1.00	0.98	5834	3261

**Table 2: Top 20 auditors**

The table presents summary statistics of 20 largest auditors by revenue. *N of clients* is number of companies audited by the specific auditor in 1999-2003. *N of obs* is number of company-years audited by the auditor. *Revenue of clients* is the average book revenue of auditor's clients. *Audit fees* is the average audit fees paid to auditors for the corresponding years. *Other fees* is average of other payments (including consulting) paid to auditors for the corresponding years.

Auditor	Audit fees \$000's	Other fees \$000's	N of obs.	N of clients	Revenue of clients, \$000's
(1)	(2)	(3)	(4)	(5)	(6)
PWC	\$217.3	\$179.5	387	180	\$300,791
KPMG	\$178.5	\$46.1	178	87	\$293,770
Ernst & Young	\$75.8	\$10.3	147	89	\$110,086
Deloitte & Touche	\$66.5	\$35.8	75	41	\$150,945
BDO	\$46.9	\$35.4	125	88	\$89,779
FBK	\$30.7	\$10.3	141	82	\$90,241
Baker Tilly Russaudit	\$28.3	\$18.9	104	58	\$24,528
RCM T.A.	\$28.2	\$6.1	83	45	\$77,213
Scott, Riggs, and Fletcher	\$26.5	\$0.1	5	3	\$284,897
Tax Bureau	\$25.5	\$15.0	18	12	\$106,509
Rosexpertiza	\$22.5	\$7.9	126	77	\$54,970
SBT	\$18.5	\$13.0	63	45	\$55,281
Top Audit	\$13.9	\$7.4	21	15	\$32,878
Nexia Pacioli	\$12.0	\$28.7	65	38	\$60,356
RBS	\$7.4	\$1.2	34	29	\$15,655
Finexpertiza	\$7.1	\$1.7	102	74	\$12,692
MCF	\$6.9	\$2.3	21	11	\$24,223
ProfAudit	\$6.0	\$1.6	110	69	\$13,351
TehExergo	\$5.8	\$2.6	5	5	\$29,650
NPG	\$5.4	\$2.4	17	12	\$5,812
AVERAGE	\$3.6	\$2.1	22.6	14.3	\$27,464

**Table 3: Auditing and Income Diversion**

The table describes the relation between income diversion and auditing. *Industry*, *Region*, and *Year* are industry, region, and year dummies. All other variables are defined in Appendix B. Panel A contains the OLS regressions. Column (1) contains regressions for the entire sample. Columns (2) and (3) present regressions for the sample of firms with audited financial statements. Panel B contains the propensity score matching estimates. Columns (1) - (3) compare audited and not audited firms. Columns (4) - (6) compare audited by Big 4 and not audited by Big 4 firms in a sample of audited firms. The numbers in parentheses are robust standard errors, clustered at the firm's level. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels.

**Panel A: OLS Regressions**

Dependent var:	ShadowR		
	(1)	(2)	(3)
Audited	-0.0068 (0.0023)***		
Audited by Big 4		-0.0119 (0.0035)***	
Log(Revenue of auditor)			-0.0027 (0.0008)***
Auditor tenure	-0.0011 (0.0012)	-0.0008 (0.0014)	-0.0009 (0.0013)
Log(Revenue)	-0.0110 (0.0005)***	-0.0063 (0.0009)***	-0.0059 (0.0009)***
EBT/Assets	-0.0121 (0.0028)***	-0.0275 (0.0059)***	-0.0277 (0.0059)***
Debt/Assets	-0.0038 (0.0024)	0.0146 (0.0063)**	0.0146 (0.0063)**
Gov Control	-0.0290 (0.0019)***	-0.0151 (0.0033)***	-0.0149 (0.0033)***
InvRec	0.0250 (0.0024)***	0.0231 (0.0057)***	0.0222 (0.0057)***
Loss	-0.0104 (0.0016)***	-0.0163 (0.0036)***	-0.0161 (0.0036)***
Ceo_owner	0.0129 (0.0019)***	0.0208 (0.0052)***	0.0199 (0.0052)***
Log(N_owners)	-0.0084 (0.0012)***	-0.0017 (0.0022)	-0.0018 (0.0022)
Industry dummy	Y	Y	Y
Region dummy	Y	Y	Y
Year dummy	Y	Y	Y
R-sq	0.068	0.072	0.073
Number of obs	51815	5834	5834
Number of firms	25824	3261	3261

**Panel B: Propensity Score Matching**

	Audited=1 (1)	Audited=0 (2)	Difference (3)	Audited by Big 4 =1 (4)	Audited by Big 4 =0 (5)	Difference (6)
ShadowR	0.0488	0.0568	-0.0079 (0.0019)***	0.0244	0.0315	-0.0071 (0.0039)*
Log(Revenue)	Y	Y	Y	Y	Y	Y
EBT/Assets	Y	Y	Y	Y	Y	Y
Debt/Assets	Y	Y	Y	Y	Y	Y
Gov Control	Y	Y	Y	Y	Y	Y
InvRec	Y	Y	Y	Y	Y	Y
Loss	Y	Y	Y	Y	Y	Y
Ceo_owner	Y	Y	Y	Y	Y	Y
Log(N_owners)	Y	Y	Y	Y	Y	Y
Industry dummy	Y	Y	Y	Y	Y	Y
Region dummy	Y	Y	Y	Y	Y	Y
Year dummy	Y	Y	Y	Y	Y	Y
Number of obs	5,834	5,834	5,834	770	770	770

**Table 4: Auditing and Income Diversion: Interaction Effects**

The table presents interaction effects between income diversion, auditing and various intermediating factors. Industry, Region, and Year are industry, region, and industry dummies. All other variables are defined in Appendix B. Panel A contains regressions for the entire sample. Panel B presents regressions for the sample of firms with audited financial statements. The numbers in parentheses are robust standard errors, clustered at the firm level. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels.

**Panel A: Sample consists of all firms**

Dependent var: ShadowR	(1)	(2)	(3)	(4)	(5)
Audited	-0.0495 (0.008)***	-0.0076 (0.0024)***	-0.0085 (0.0028)***	-0.0105 (0.003)***	-0.0109 (0.0024)***
Audited*Log(Revenue)	0.0051 (0.0009)***				
Audited*Gov control		0.0097 (0.0032)***			
Audited*Ceo_owner			0.0049 (0.0047)		
Audited*Log(N_owners)				0.0047 (0.0024)**	
Audited*Debt/Assets					0.0263 (0.0061)***
Auditor Tenure	-0.0024 (0.0012)*	-0.0012 (0.0012)	-0.0011 (0.0012)	-0.0012 (0.0012)	-0.0012 (0.0012)
Log(Revenue)	-0.0120 (0.0005)***	-0.0109 (0.0005)***	-0.0110 (0.0005)***	-0.0110 (0.0005)***	-0.0110 (0.0005)***
EBT/Assets	-0.0123 (0.0028)***	-0.0121 (0.0028)***	-0.0121 (0.0028)***	-0.0121 (0.0028)***	-0.0122 (0.0028)***
Debt/Assets	-0.0036 (0.0024)	-0.0037 (0.0024)	-0.0037 (0.0024)	-0.0038 (0.0024)	-0.0066 (0.0026)***
Gov control	-0.0271 (0.0019)***	-0.0297 (0.002)***	-0.0276 (0.0018)***	-0.0274 (0.0019)***	-0.0272 (0.0019)***
InvRec	0.0261 (0.0024)***	0.0259 (0.0024)***	0.0260 (0.0024)***	0.0260 (0.0024)***	0.0261 (0.0024)***
Loss	-0.0102 (0.0016)***	-0.0103 (0.0016)***	-0.0103 (0.0016)***	-0.0103 (0.0016)***	-0.0104 (0.0016)***
Ceo_owner	0.0104 (0.0019)***	0.0106 (0.0019)***	0.0101 (0.002)***	0.0104 (0.0019)***	0.0106 (0.0019)***
Log(N_owners)	-0.0008 (0.0002)***	-0.0008 (0.0002)***	-0.0008 (0.0002)***	-0.0009 (0.0003)***	-0.0008 (0.0002)***
Industry, Region, Year dummy	Y	Y	Y	Y	Y
R-sq	0.068	0.067	0.067	0.067	0.068
Number of obs	51815	51815	51815	51815	51815
Number of firms	25824	25824	25824	25824	25824



**Panel B: Sample consists of audited firms**

Dependent var: ShadowR	(1)	(2)	(3)	(4)	(5)
Audited by Big4	-0.0819 (0.0175)***	-0.0119 (0.0035)***	-0.0220 (0.0043)***	-0.0216 (0.0047)***	-0.0083 (0.0045)*
Audited by Big4*Log(Revenue)	0.0069 (0.0017)***				
Audited by Big4*Gov control		0.0076 (0.0127)			
Audited by Big4*Ceo_owner			0.0462 (0.0185)**		
Audited by Big4*Log(N_owners)				0.0131 (0.0047)***	
Audited by Big4*Debt/Assets					-0.0144 (0.0115)
Auditor Tenure	-0.0008 (0.0013)	-0.0008 (0.0013)	-0.0008 (0.0013)	-0.0008 (0.0013)	-0.0008 (0.0013)
Log(Revenue)	-0.0077 (0.0009)***	-0.0063 (0.0009)***	-0.0065 (0.0009)***	-0.0064 (0.0009)***	-0.0064 (0.0009)***
EBT/Assets	-0.0278 (0.0059)***	-0.0277 (0.0059)***	-0.0271 (0.0059)***	-0.0272 (0.0059)***	-0.0277 (0.0059)***
Debt/Assets	0.0161 (0.0063)**	0.0149 (0.0063)**	0.0150 (0.0063)**	0.0146 (0.0063)**	0.0175 (0.0072)**
Gov control	-0.0153 (0.0033)***	-0.0151 (0.0033)***	-0.0154 (0.0033)***	-0.0150 (0.0033)***	-0.0148 (0.0033)***
InvRec	0.0233 (0.0057)***	0.0231 (0.0057)***	0.0240 (0.0057)***	0.0237 (0.0057)***	0.0230 (0.0057)***
Loss	-0.0161 (0.0036)***	-0.0161 (0.0036)***	-0.0157 (0.0035)***	-0.0158 (0.0036)***	-0.0160 (0.0036)***
Ceo_owner	0.0194 (0.0049)***	0.0203 (0.0049)***	0.0171 (0.0049)***	0.0195 (0.0049)***	0.0204 (0.0049)***
Log(N_owners)	-0.0004 (0.0001)**	-0.0003 (0.0002)**	-0.0003 (0.0001)**	-0.0004 (0.0002)**	-0.0003 (0.0001)**
Industry, Region, Year dummy	Y	Y	Y	Y	Y
R-sq	0.075	0.073	0.075	0.074	0.073
Number of obs	5834	5834	5834	5834	5834
Number of firms	3261	3261	3261	3261	3261

**Table 5: Fees to Auditors and Income Diversion**

The table shows the relation between auditors' fees and income diversion. Panel A contains regressions with *Audit fees* as a dependent variable. Panel B presents regressions with *Other fees to auditors* as a dependent variable. All variables are defined in Appendix B. *Industry*, *Region*, and *Year* are industry, region, and industry dummies. The numbers in parentheses are robust standard errors, clustered at the auditor's level. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels.

<b>Panel A. Audit fees and income diversion</b>				
Dependent var:	Log(Audit fees)			
	(1)	(2)	(3)	(4)
Big 4	1.444 (0.116)***	1.442 (0.116)***	1.408 (0.114)***	1.418 (0.112)***
ShadowR		-0.201 (0.185)	-0.267 (0.193)	
Big 4*ShadowR			1.295 (0.379)***	1.036 (0.322)***
Auditor tenure	0.092 (0.02)***	0.092 (0.02)***	0.091 (0.02)***	0.092 (0.02)***
Log(Revenue)	0.377 (0.019)***	0.375 (0.018)***	0.375 (0.018)***	0.377 (0.019)***
EBT/Assets	0.230 (0.089)***	0.225 (0.089)**	0.229 (0.088)***	0.235 (0.088)***
Debt/Assets	0.061 (0.076)	0.064 (0.076)	0.065 (0.076)	0.061 (0.076)
Gov Control	0.015 (0.093)	0.012 (0.093)	0.010 (0.093)	0.014 (0.093)
InvRec	-0.467 (0.076)***	-0.463 (0.076)***	-0.461 (0.076)***	-0.467 (0.076)***
Loss	0.110 (0.048)**	0.106 (0.048)**	0.107 (0.048)**	0.111 (0.048)**
Ceo_owner	-0.219 (0.058)***	-0.215 (0.059)***	-0.216 (0.059)***	-0.221 (0.058)***
Log(N_owners)	0.015 (0.034)	0.014 (0.034)	0.014 (0.034)	0.014 (0.034)
Industry dummy	Y	Y	Y	Y
Region dummy	Y	Y	Y	Y
Year dummy	Y	Y	Y	Y
R-sq	0.535	0.535	0.535	0.535
Number of obs	5834	5834	5834	5834
Number of auditors	264	264	264	264

<b>Panel B. Other fees to auditors and income diversion</b>				
Dependent var:	Log(Other fees to auditors)			
	(1)	(2)	(3)	(4)
Big 4	1.356 (0.105)***	1.357 (0.106)***	1.292 (0.108)***	1.296 (0.107)***
ShadowR		0.065 (0.347)	-0.104 (0.354)	
Big 4*ShadowR			2.980 (1.051)***	2.878 (0.979)***
Auditor tenure	0.032 (0.036)	0.032 (0.036)	0.032 (0.036)	0.032 (0.036)
Log(Revenue)	0.385 (0.025)***	0.386 (0.025)***	0.385 (0.025)***	0.385 (0.025)***
EBT/Assets	0.114 (0.156)	0.115 (0.156)	0.127 (0.153)	0.128 (0.153)
Debt/Assets	-0.071 (0.119)	-0.072 (0.119)	-0.084 (0.119)	-0.085 (0.119)
Gov Control	0.027 (0.155)	0.028 (0.156)	0.023 (0.156)	0.025 (0.155)
InvRec	-0.347 (0.171)**	-0.348 (0.17)**	-0.338 (0.173)*	-0.340 (0.173)**
Loss	0.101 (0.106)	0.102 (0.106)	0.105 (0.104)	0.106 (0.104)
Ceo_owner	-0.229 (0.095)**	-0.231 (0.095)**	-0.234 (0.095)**	-0.237 (0.095)**
Log(N_owners)	-0.032 (0.062)	-0.032 (0.062)	-0.032 (0.062)	-0.032 (0.062)
Industry dummy	Y	Y	Y	Y
Region dummy	Y	Y	Y	Y
Year dummy	Y	Y	Y	Y
R-sq	0.447	0.447	0.448	0.448
Number of obs	1955	1955	1955	1955
Number of auditors	216	216	216	216

**Table 6: Auditor Propensity for Corruption**

**Panel A:** The table describes the summary statistics of Propensity to Corrupt measure developed by Mironov (2015). PTC Top 5 is the average PTC of the top 5 highest paid employees. PTC Top 25% is the average PTC of the top 25% highest paid employees. PTC Bottom 75% is the average PTC of the 75% lowest paid employees. Corr PTC top 25% PTC Bottom 75% is the correlation between PTC Top 25% and PTC Bottom 25%

	PTC Top 5 (1)	PTC Top 25% (2)	PTC Bottom 75% (3)	Correlation PTC Top 25%, PTC Bottom 75% (4)	N obs (5)
All firms	4.273	4.340	4.447	0.233	30146
Not audited firms	4.285	4.330	4.432	0.232	26192
Audited firms, by non-Big 4	4.206	4.411	4.539	0.234	3534
Audited firms, by Big 4	4.084	4.365	4.558	0.324	420
All auditors	3.943	3.996	4.217	0.138	4730
Non-Big 4	4.025	4.021	4.222	0.118	4034
Big 4	3.462	3.848	4.186	0.595	696

**Table 6 (continued): Auditor Corruption**

**Panel B:** The table describes the relation between fees paid to auditors and auditors' corruptness (PTC). Auditor PTC is the average propensity to corrupt of Top 25% highest paid auditor employees. *Industry*, *Region*, and *Year* are industry, region, and year dummies. All other variables are defined in Table 1. The numbers in parentheses are robust standard errors, clustered at the firm's level. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels.

Dependent var:	Log(Audit fees)		Log(Other fees)	
	(1)	(2)	(3)	(4)
Big 4	1.443 (0.107)***	1.386 (0.123)***	1.369 (0.114)***	0.701 (0.29)**
ShadowR	-0.276 (0.212)	-0.218 (0.497)	-0.110 (0.425)	0.726 (1.668)
Big 4*ShadowR	1.561 (0.295)***	-0.927 (1.353)	3.217 (1.229)***	-37.809 (10.895)***
Auditor PTC	0.035 (0.019)*	0.035 (0.021)*	-0.034 (0.029)	-0.033 (0.037)
Big 4*Auditor PTC		0.015 (0.045)		0.176 (0.067)***
Auditor PTC*ShadowR		-0.016 (0.108)		-0.208 (0.378)
Big 4*Auditor PTC*ShadowR		0.630 (0.357)*		9.819 (2.493)***
Auditor tenure	0.091 (0.022)***	0.091 (0.022)***	0.032 (0.043)	0.031 (0.043)
Log(Revenue)	0.357 (0.02)***	0.357 (0.02)***	0.371 (0.027)***	0.369 (0.026)***
EBT/Assets	0.169 (0.087)*	0.169 (0.087)*	-0.087 (0.15)	-0.084 (0.149)
Debt/Assets	0.040 (0.085)	0.040 (0.086)	-0.185 (0.123)	-0.161 (0.125)
Gov Control	-0.017 (0.098)	-0.018 (0.098)	-0.061 (0.155)	-0.061 (0.156)
InvRec	-0.413 (0.08)***	-0.412 (0.081)***	-0.313 (0.181)*	-0.322 (0.181)*
Loss	0.086 (0.049)*	0.086 (0.049)*	0.028 (0.108)	0.023 (0.109)
Ceo_owner	-0.262 (0.057)***	-0.262 (0.057)***	-0.273 (0.104)***	-0.265 (0.103)**
Log(N_owners)	0.001 (0.038)	0.001 (0.038)	-0.028 (0.072)	-0.037 (0.072)
Industry, Region, Year dummy	Y	Y	Y	Y
R-sq	0.559	0.559	0.462	0.465
Number of obs	4730	4730	1599	1599
Number of auditors	207	207	178	178

**Table 6 (continued): Auditor Corruption**

**Panel C:** The table shows the relation between auditor fees and corruptness (PTC) of the 75% lowest paid auditor employees. All variables are defined in Table 1. Auditor PTC is the average propensity to corrupt of the bottom 3 quartiles (25% to 100%) by pay auditor employees. Robust standard errors, clustered at the firm level are in parentheses. \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels.

Dependent var:	Log(Audit fees)		Log(Other fees)	
	(1)	(2)	(3)	(4)
Big 4	1.439 (0.108)***	1.605 (0.284)***	1.373 (0.112)***	1.543 (0.687)**
ShadowR	-0.277 (0.207)	-1.255 (0.73)*	-0.109 (0.428)	1.004 (1.725)
Big 4*ShadowR	1.550 (0.309)***	5.375 (3.456)	3.220 (1.248)***	-20.700 (13.26)
Auditor PTC	0.064 (0.026)**	0.052 (0.031)*	-0.029 (0.043)	-0.018 (0.051)
Big 4*Auditor PTC		-0.040 (0.071)		-0.040 (0.149)
Auditor PTC*ShadowR		0.237 (0.163)		-0.246 (0.353)
Big 4*Auditor PTC*ShadowR		-0.911 (0.783)		5.592 (3.182)*
Auditor tenure	0.093 (0.022)***	0.094 (0.022)***	0.031 (0.043)	0.032 (0.043)
Log(Revenue)	0.356 (0.02)***	0.357 (0.02)***	0.371 (0.027)***	0.370 (0.027)***
EBT/Assets	0.167 (0.086)*	0.165 (0.086)*	-0.087 (0.149)	-0.084 (0.151)
Debt/Assets	0.028 (0.085)	0.030 (0.085)	-0.182 (0.122)	-0.174 (0.122)
Gov Control	-0.009 (0.095)	-0.009 (0.096)	-0.074 (0.157)	-0.075 (0.157)
InvRec	-0.410 (0.08)***	-0.412 (0.079)***	-0.317 (0.184)*	-0.323 (0.188)*
Loss	0.089 (0.048)*	0.088 (0.048)*	0.023 (0.109)	0.022 (0.108)
Ceo_owner	-0.258 (0.056)***	-0.256 (0.056)***	-0.277 (0.104)***	-0.281 (0.104)***
Log(N_owners)	0.006 (0.037)	0.006 (0.037)	-0.031 (0.071)	-0.030 (0.07)
Industry, Region, Year dummy	Y	Y	Y	Y
R-sq	0.559	0.560	0.462	0.462
Number of obs	4730	4730	1599	1599
Number of auditors	207	207	178	178

**Table 6 (continued): Auditor Corruption**

**Panel D:** The table describes the relation between firms ShadowR, auditors' corruptness (Auditor PTC) and firms' corruptness (Firm PTC). Auditor PTC is the average propensity to corrupt of Top 25% highest paid auditor employees. Firm PTC is the average propensity to corrupt of Top 5 firms highest paid employees. The number of observations changes across the columns because the PTC measure is available only for Moscow firms (auditors). *Industry, Region, and Year* are industry, region, and year dummies. All other variables are defined in Table 1. The numbers in parentheses are robust standard errors, clustered at the firm's level. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels.

Dependent var:	ShadowR				
	(1)	(2)	(3)	(4)	(5)
Audited	-0.008 (0.002)***				
Big 4	-0.010 (0.005)**	-0.042 (0.014)***	-0.043 (0.019)**	-0.043 (0.019)**	-0.042 (0.019)**
Firm PTC	0.0015 (0.0004)***		0.0022 (0.001)**	0.0035 (0.0028)	0.0035 (0.0028)
Auditor PTC		-0.0009 (0.001)	-0.0013 (0.001)	0.0001 (0.003)	0.0001 (0.003)
Big 4*Auditor PTC		0.0083 (0.004)**	0.0070 (0.005)	0.0070 (0.005)	0.0074 (0.005)
Auditor PTC*Firm PTC				-0.0003 (0.001)	-0.0003 (0.001)
Big 4*Auditor PTC*Firm PTC					-0.0001 (0.001)
Auditor tenure		-0.0007 (0.001)	-0.0006 (0.002)	-0.0006 (0.002)	-0.0006 (0.002)
Log(Revenue)	-0.011 (0.001)***	-0.006 (0.001)***	-0.006 (0.001)***	-0.006 (0.001)***	-0.006 (0.001)***
EBT/Assets	-0.018 (0.003)***	-0.029 (0.006)***	-0.031 (0.007)***	-0.030 (0.007)***	-0.031 (0.007)***
Debt/Assets	0.000 (0.003)	0.016 (0.007)**	0.016 (0.009)*	0.016 (0.009)*	0.016 (0.009)*
Gov Control	-0.027 (0.003)***	-0.013 (0.004)***	-0.008 (0.005)*	-0.008 (0.005)*	-0.008 (0.005)*
InvRec	0.029 (0.003)***	0.028 (0.006)***	0.035 (0.007)***	0.035 (0.007)***	0.035 (0.007)***
Loss	-0.013 (0.002)***	-0.019 (0.004)***	-0.020 (0.005)***	-0.020 (0.005)***	-0.020 (0.005)***
Ceo_owner	0.014 (0.002)***	0.020 (0.006)***	0.021 (0.006)***	0.021 (0.006)***	0.021 (0.006)***
Log(N_owners)	-0.008 (0.001)***	-0.002 (0.002)	-0.002 (0.002)	-0.002 (0.002)	-0.002 (0.002)
Industry dummy	Y	Y	Y	Y	Y
Region dummy	Y	Y	Y	Y	Y
Year dummy	Y	Y	Y	Y	Y
R-sq	0.073	0.079	0.081	0.081	0.081
Number of obs	30146	4730	3308	3308	3308
Number of firms	13929	2822	1966	1966	1966

**Table 7: Audit and Cost of Debt**

The table describes the relation between debt interest rate and audit. All variables are defined in Appendix B. [-1] indicates a lag by one year. *Industry*, *Region*, and *Year* are industry, region, and year dummies. Columns (1) – (4) contain regressions for the entire sample. Columns (5) – (7) present regressions for the sample of firms with audited financial statements. The numbers in parentheses are robust standard errors, clustered at the firm’s level. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels.

Dependent var:	Debt interest rate						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Audited[-1]	-0.0064 (0.0031)**	-0.0069 (0.0034)**	-0.0031 (0.0033)	-0.0024 (0.0038)			
Audited by Big 4[-1]			-0.0220 (0.0058)***	-0.0260 (0.0061)***	-0.0196 (0.0067)***	-0.0242 (0.007)***	
Log(Rev. of auditor)[-1]							-0.0046 (0.0015)***
Log(Revenue)	-0.0066 (0.0008)***	-0.0066 (0.0008)***	-0.0061 (0.0009)***	-0.0061 (0.0009)***	-0.0054 (0.0017)***	-0.0054 (0.0017)***	-0.0048 (0.0018)***
EBT/Assets	-0.0172 (0.0089)*	-0.0171 (0.0089)*	-0.0150 (0.0089)*	-0.0148 (0.0089)*	0.0047 (0.0186)	0.0055 (0.0187)	0.0031 (0.0185)
Debt/Assets	-0.1046 (0.0044)***	-0.1046 (0.0044)***	-0.1043 (0.0044)***	-0.1042 (0.0044)***	-0.1004 (0.0104)***	-0.0997 (0.0104)***	-0.0994 (0.0104)***
Gov Control	0.0297 (0.0072)***	0.0297 (0.0072)***	0.0284 (0.0072)***	0.0284 (0.0072)***	0.0520 (0.0149)***	0.0516 (0.0149)***	0.0535 (0.0147)***
Loss	-0.0058 (0.0032)*	-0.0058 (0.0032)*	-0.0055 (0.0032)*	-0.0055 (0.0032)*	0.0012 (0.0074)	0.0012 (0.0074)	0.0006 (0.0074)
Current Ratio	-0.0019 (0.0011)*	-0.0019 (0.0011)*	-0.0019 (0.0011)*	-0.0019 (0.0011)*	0.0001 (0.0022)	0.0002 (0.0022)	0.0004 (0.0022)
PPE	-0.0286 (0.0062)***	-0.0285 (0.0062)***	-0.0274 (0.0063)***	-0.0273 (0.0063)***	-0.0309 (0.0137)**	-0.0304 (0.0137)**	-0.0312 (0.0136)**
NegEquity	0.0045 (0.0035)	0.0045 (0.0035)	0.0049 (0.0035)	0.0049 (0.0035)	0.0048 (0.0083)	0.0044 (0.0083)	0.0046 (0.0082)



Ceo_owner	0.0129 (0.0037)***	0.0129 (0.0037)***	0.0128 (0.0037)***	0.0128 (0.0037)***	0.0117 (0.0092)	0.0115 (0.0092)	0.0095 (0.0092)
Log(N_owners)	0.0028 (0.0025)	0.0028 (0.0025)	0.0027 (0.0025)	0.0027 (0.0025)	0.0060 (0.0048)	0.0059 (0.0048)	0.0060 (0.0048)
ShadowR	0.0332 (0.0123)***	0.0322 (0.0131)**	0.0330 (0.0123)***	0.0334 (0.0131)**	0.0286 (0.0309)	0.0187 (0.0319)	0.0246 (0.031)
ShadowR*Audited[-1]		0.0093 (0.0317)		-0.0130 (0.0329)			
ShadowR*Big 4[-1]				0.1466 (0.1087)		0.1642 (0.1177)	
Industry dummy	Y	Y	Y	Y	Y	Y	Y
Region dummy	Y	Y	Y	Y	Y	Y	Y
Year dummy	Y	Y	Y	Y	Y	Y	Y
R-sq	0.098	0.098	0.099	0.099	0.148	0.148	0.149
Number of obs	12931	12931	12931	12931	2214	2214	2214
Number of firms	7374	7374	7374	7374	1350	1350	1350