Capital Structure and Oligarch Ownership

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Abstract

This study examines the effects of oligarch ownership on corporate capital structures. Using panel data from Ukraine, I find that oligarch–owned companies employ significantly more debt and liabilities than their peers. However, there is no direct relation between oligarch ownership and target capital structure. Whereas the determinants of target leverage are similar across all owners, differences in firm characteristics also have a fairly small effect. I show that larger leverage is due to better access to debt, which results in lower rebalancing costs and faster restructurings of oligarch–owned companies. The findings clearly suggest that oligarchs benefit from the accumulated advantages.

JEL: G32, P31

Keywords: Capital Structure, Leverage, Oligarchs, Influential Ownership, Connected Firms, Cumulative Advantage

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1 Introduction

Capital structure and corporate control are among many unresolved issues facing modern economics. Both fields yielded an enormous body of literature, which, however, often relies on the evidence from developed and especially Anglo-Saxon markets. This work examines capital structure in the post-Soviet market (Ukraine), which might be interesting in terms of international discussion.

First, Ukrainian market is dominated by influential owners, known as oligarchs[1]. Secondly, the Ukrainian economy has the main features of emerging markets, such as poor protection of property rights, concentrated ownership, and weak separation between management and ownership. Such features provide a favorable environment for influential owners.

Thirdly, in contrast to more general cases of political ties or group affiliation, oligarch ownership could be treated as exogenous. It was typically set in early-mid 1990s during the period of privatization. For instance, in my sample median oligarch–owned enterprise was privatized in 1995, preserving its ownership in later periods. Although firm selection

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[1]The term "oligarch" denotes a post-Soviet industrial and/or financial magnate (usually Russian or Ukrainian) who *"controls sufficient resources to influence national politics"* (Guriev and Rachinsky 2005).

during the privatization was not random, subsequent differences cannot be separated from oligarch ownership itself. Hence, two decades after privatization one may argue that oligarch ownership is predetermined by the 1990s reforms, but there is no clear reversed relationship with present-day leverage.

Using comprehensive dataset of Ukrainian public companies from 2002 to 2016, I study the effects of oligarch ownership on corporate capital structures. I identify 35 oligarchic groups, 26 of which are covered by my dataset. As a preview, oligarch–owned companies tend to use significantly more debt and liabilities than their peers. However, there is no direct relation between oligarch ownership and target capital structure. The determinants of target leverage are similar across all owners, and differences in firm characteristics (specifically, firm size) also have a fairly small effect. Further analysis reveals that the differences are due to better access to debt, which results in lower re-balancing costs and faster restructurings of oligarch–owned companies. Hence, the evidence clearly indicates that influential owners gain from the accumulated advantages.

The results add to several strands in the studies. First, this study follows along a growing literature on capital structure of emerging markets. Previous evidence (e.g., Booth et al. 2001) suggests that capital structure decisions in developing markets are driven by the same variables as in developed ones, although there are persistent institution-specific differences. However, available information on capital structure of transition markets (and, more specifically, Ukraine) remains partial and incomplete. In particular, available works verify the context of Central Europe (Nivorozhkin 2004, 2005; De Haas and Peeters 2006; Jõeveer 2013) and Russia (Ivashkovskaya and Solntseva 2007; Pöyry and Maury 2010). In sharp contrast, only one published study explores Ukrainian firms (Stephan et al. 2011).

Next, this study also adds to the research of ownership effects, and more specifically effects of influential ownership (see a review in the next section). Finally, the results verify the suggestion that oligarchs boost performance due to better access to debt (Guriev and Rachinsky 2005; Gorodnichenko and Grygorenko 2008). However, the implications are not strictly positive, as Gorodnichenko and Grygorenko (2008) suggest. Recent evidence emphasizes the role of firm-level persistence in macro-level path dependence (e.g., Gokhberg and Roud 2016). In similar fashion, the relative effectiveness of oligarch–owned firms may be caused by intentional distortions in access to credit. This implies that better performance of these firms could be the cause of macro-level path dependence in the long-term. Therefore, any efforts to suppress insider lending should be welcomed.

The remainder of the paper organized as follows. Section 2 briefly reviews the existing literature with a focus on the effects of influential ownership. Section 3 provides data sources, measurement of variables, and oligarch definition. Section 4 offers empirical model, results, and robustness checks. Finally, Section 5 concludes.

2 Capital Structure and Influential Ownership

Capital structure studies, started by the Miller–Modigliani theorem, developed into an enormous body of literature, both theoretical and empirical[2]. In particular, ownership effects usually refer to the agency theory and principal-–agent problem. In the agency

[2]Two main focuses of capital structure studies include the determinants of capital structure choice (e.g., Rajan and Zingales 1995; Jõeveer 2013) and testing of the particular theories, such as static trade-off, dynamic trade-off, pecking order, agency theory, or market timing model.

theory (Jensen and Meckling 1976) tax advantages of debt are weighted against agency costs (sum of residual loss and monitoring and bonding expenditures). Jensen (1986) also argues that higher leverage has a disciplining effect due to obligatory debt repayments. Indeed, these arguments have merit in developed markets. However, in emerging markets ownership concentration is typically very high, while the separation between management and ownership is weak or even absent. Since an owner involved in every-day corporate operations, agency theory cannot be applied. Furthermore, oligarch–owned firms benefit from their accumulated advantages, or "Matthew effect"[3].

First, oligarchs benefit from their group affiliations, which could improve the member's efficiency. Chang and Hong (2000) and Manos et al. (2007) suggest that large business groups have higher ability to borrow from internal sources. In addition, group affiliation may affect incentives, as in the model of "productive oligarchs" proposed by Gorodnichenko and Grygorenko (2008). Resembling the Olson's "stationary bandit" argument, this model predicts that oligarchs are more likely invest in productivity-enhancing projects and thus might employ more debt.

Secondly, influential owners benefit from the existence of affiliated banks in their groups. This affiliation facilitates new borrowings due to reduced information asymmetries. Moreover, affiliated banks might lend on preferential conditions (for example, require less collateral), or even beyond the creditworthiness.

In contrast, non-oligarch firms face a very limited financing choice due to a significant share of the oligarch–owned banks. Borrowing in these banks might be undesired due to mandatory disclosure of the business processes and value of assets or even impossible when your business is a competitor of the oligarch's. Hence, the existence of affiliated banks might reduce debt financing of non-oligarch firms. The largest Ukrainian bank "PrivatBank" (21% of total banking assets in 2016) appears to be anecdotal evidence on this issue. PrivatBank was oligarch-owned, and market participants thought that inside credits constituted about 90% of its loan portfolio. Unsurprisingly, after nationalization on December 18, 2016, Central Bank stated that insiders make up about 97% of the bank's corporate loans[4].

Thirdly, oligarch firms have also the advantage of political connections. Fisman (2001) and Faccio (2006) argue that political connections explain a large share of firms' value. Dinç (2005) also demonstrates that political connections facilitate lending from government-owned banks. Similarly, Faccio (2006) suggests that political connections make cheap credit available in state banks. Not surprisingly, a significant strand of studies reports a positive and significant link between political connections and firms' lending (Khwaja and Mian 2005; Charumilind et al. 2006; Fraser et al. 2006; Ebrahim et al. 2014; Saeed et al. 2015). In addition, Faccio et al. (2006) suggest that politically-connected firms are more likely to be bailed out from default than their non-connected peers. Thus, connected firms have an incentive to use more debt and over-invest.

Even more, there seems to be an interrelation between political connections and existence of affiliated banks. Specifically, Baum et al. (2008) find that politically affiliated Ukrainian banks have significantly lower interest rate margins and thus higher capitalization. Hence, oligarchs may benefit more from their captive banks due to the presence of political connections.

[3] *"For whoever has will be given more, and they will have an abundance. Whoever does not have, even what they have will be taken from them"* — The Bible (New International Version), Matthew 25:29.

[4] See KyivPost, *"Government nationalizes PrivatBank, guarantees deposits"* (Dec. 18, 2016) and BBC, *"Ukraine's biggest lender PrivatBank nationalised"* (Dec. 19, 2016).

Finally, influential owners have the advantage of property protection, and thus no problem of corporate control. Oligarchs can avoid a hostile takeover using their power and connections, whereas others cannot protect themselves in such a case. Therefore, influential owners supposed to be less selective in the usage of any external financing. This also implies irrelevance of voting share to capital structure decision.

In sum, oligarch–owned firms have both the ability and incentives to borrow more, whereas situation for non-oligarch firms is the opposite. Thus, primary hypothesis of this study is a positive relation between oligarch ownership and leverage.

3 Sample overview

3.1 Data Sources and Sample Selection

The data come from the publicly available SMIDA database, provided by the government agency responsible for disclosure policy[5]. SMIDA includes several sub-bases:

- Issuers: financial statements of 20 thousand Ukrainian firms, about half of which are public companies;
- Professional participants: information about stock exchanges, brokerages, dealers, asset management companies, auditors, depositaries;
- Violation information: violations on the securities market;
- Owners of 10%: information about blockholders (share 5% or more in 2002–2006, 10% and more since 2007);
- Issues: securities issues and registration;
- Printed publications: archives of the stock market newspapers, issued by the National Commission on Securities and Stock Market.

Following standard practice, I limit my sample to non-financial companies (due to different nature of financial firms' capital structure and high regulation). However, utilities and transport companies are not excluded due to weak government regulation. Sufficient information (such as ownership structures and financials verified by an auditor) is available only for public companies; thus, I also limit my sample to public companies (officially, open joint stock companies before 2011 and public joint stock companies since 2012).

Finally, most of the firms in the database seem to be inactive or shell companies. Typically, these firms remain registered due to red tape associated with dissolution or bankruptcy procedures. Thus, I restrict my sample to active firms (non-zero sales) with full information available for at least one year. Observations with incomplete information are not taken into account. However, where possible, I replace omitted or unreadable financial statements by ones from the firms' sites. In addition, several available observations were excluded from the sample. In particular, observations with negative equity (typically insolvent companies in bankruptcy proceedings) and observations affected by the war in Donbass (companies located in the uncontrolled and/or war zone territories)

[5]Stock Market Infrastructure Development Agency of Ukraine database, `http://smida.gov.ua`

were excluded. Almost all Donbass-located firms also fall into one of the previous criteria (zero sales, incomplete information or negative equity).

The initial SMIDA database is a strongly unbalanced panel with a large number of omissions. I select 250 firms to get a more manageable number of results. Since detailed structural information is not available, I rely on simple random sampling procedure. The final sample includes 2,340 firm-year observations from 2002 to 2016 (roughly 9.4 observations per firm; see industry and time structure in appendix A).

According to state statistical data, on average there were 7,852 public companies in 2002–2016 (both financial and non-financial). Furthermore, as mentioned below, a significant number of public companies seem to be inactive. Next, the number of all public companies declines with time (from 12,137 in 2002 to 3,122 in 2016). This trend accelerated in the early 2010s after tightening legal requirements for public companies. This tightening resulted in massive changes of the legal form, especially noticeable in 2010–2012. The data seem to follow this downward with a lag of several years. However, there is a gap in 2010, caused by lack of readable financials for this year in the SMIDA database. In sum, although there is no structural information for public companies, my sample can be considered as representative for the whole set.

3.2 Oligarch Ownership

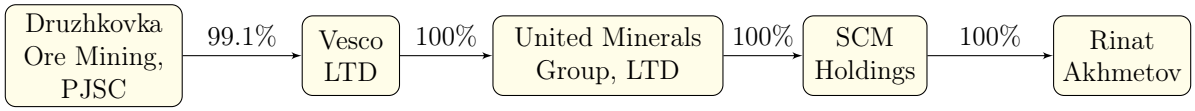
Oligarch groups are the key component in this research. I aim to define "true oligarchs", rather than just rich individuals. In this regard, stable oligarch clans should be considered as one owner due to difficulties in separation of ownership across these groups. A similar phenomenon can be found in either historical (for example, robber barons in the nineteenth-century United States) or geographical (other developing markets) perspective. Moreover, in the context of group affiliation, Japanese keiretsu and Korean chaebol are similar to post-communist oligarch business groups. Thus, I label business group an "oligarch" if it satisfies the following conditions.

First, oligarchs are the largest private owners in the country (Guriev and Rachinsky 2005). Thus, at least one group member should belong to the largest private owners. I limit my search to the participants of the "top 100 richest" rankings. These annual rankings are provided by the business magazines *Forbes* (Ukraine), *Korrespondent*, and *Focus*[6].

Influential owners tend to hide their ownership through offshore firms and/or nominee owners. Typical ownership structure includes 2–4 mediators between a public company and ultimate oligarch owner. Figure 1 shows an example of such a structure (Druzhkovka PJSC). Whenever possible, I tried to work with SMIDA information. For example, SMIDA shows that 99.1% of Druzhkovka PJSC was controlled by Vesco Limited (old name UMG United Minerals Group Limited). However, considering low transparency (as in this case), I also use hand-gathered information from business magazines, daily periodicals, and information agencies (e.g., *Korrespondent*, *Business*, *Vlast' deneg*, *Zerkalo Nedeli*, *Delovaya stolitsa*, *Delo*, *Ukrayinska Pravda*). Going back to the example, numerous mass-media sources help to trace the relation between Vesco LTD and Ahmetov. In general, oligarch ownership is not strictly anonymous, and ultimate owners could be detected in all cases.

[6]The first-ever ranking was published by *Korrespondent* in 2006. *Focus* launched its rating in 2007, whereas *Forbes* (Ukraine) published its first ranking in 2011. Several available rankings include fewer or greater than 100 persons.

Figure 1: Example of ownership structure (Druzhkovka Ore Mining in 2008–2014).



Secondly, oligarch ownership is based on the fusion of political power and property. Thus, following Gorodnichenko and Grygorenko (2008), every oligarch group has at least one representative in the parliament or government. Such a group possesses sufficient political power to promote its own interests. As in the ownership details, I extract this information from mass-media claims. Furthermore, fairly often oligarchs enter openly into politics (e.g., Poroshenko is the fifth president of Ukraine, Tihipko was Vice Prime Minister in 2010–2012, Khoroshkovskyi was First Vice Prime Minister of Ukraine in 2012).

Thirdly, oligarchs control multiple businesses (at least 2), which intensively coordinate their activities in day-to-day operations. This definition excludes single-business owners and executive top managers. Furthermore, a day-to-day operations criterion excludes partnerships between different oligarch groups (e.g., System Capital Management and Smart Holding or Ukrprominvest/Roshen and Energy Standard). Such partnerships imply strategic coordination rather than effective day-to-day control.

Based on these criteria, I identify 35 oligarchic groups (Table 1), 26 of which are covered by my dataset. Several firms in the sample are owned by two oligarch groups (oligarch partnerships). Oligarch-owned firms constitute 25.4% of observations and 24.0% of firms (for 6.4% of the firms an owner has changed during the period of research). The oligarch's share of public companies tends to increase with time (see appendix A).

Oligarch presence is especially noticeable in the mining, manufacture of machinery and electrical equipment, food production, metallurgy, and utilities. In contrast, there is no oligarch–owned firm in apparel production and a very small number in construction materials and wood manufacturing.

3.3 Variables Definition

Table 2 provides definitions of the variables used in the study. Dependent variables are different measures of leverage: debt-to-capital ratio (DTC) and liabilities-to-assets ratio (LTA). Debt-to-capital ratio (DTC) is calculated as debt to the sum of debt and equity. Following previous studies (e.g., Rajan and Zingales 1995) debt denotes only financial (interest-bearing) debt. Liabilities-to-assets ratio (LTA) represents more broad definition of leverage, which includes non-financial liabilities, such as deferred tax, accounts payable, tax payable, accrued expenses, and provisions. LTA is calculated as total liabilities (assets minus equity) to total assets. This study does not use more common financial-debt-to-assets ratio. As Welch (2011) argues, this is incorrect measure, which counts non-financial liabilities as the equivalent of equity.

All dependent variables are book ratios due to several reasons. First, the market value of equity might be affected by the type of owner (Driffield et al. 2007; Maury and Liljeblom 2009; Pöyry and Maury 2010). Secondly, Fama and French (2002) also point out that market leverage is not completely under managers' direct control, and therefore book leverage is better as target ratio. Thirdly, book values refer to "assets in place" which is better coverage of debt than growth opportunities (Myers 1977). Finally, market data might be unreliable due to small trade volumes and the common practice of

Table 1: Ukrainian oligarchic groups in 2002–2016

Group	Owners (members)	Sample	
		Firms	Obs.
System Capital Management	Akhmetov	10	109
Smart Holding	Novinsky, Klyamko	6	47
Energy Standard	Grigorishin	5	60
Industrial Union of Donbas	Taruta, Mkrtchian, Haiduk	5	40
Energo	Nusenkis, Baisarov	4	56
Privat	Kolomoyskyi, Boholyubov, Martynov	4	37
Group DF	Firtash, Lyovochkin, Boyko	4	31
Universal Investment Group	Antonov	3	35
Azovmash	Yuriy & Arsen Ivanyushchenko	3	28
Kernel	Verevsky	2	27
Motor Sich	Boguslayev	2	22
Ukrprominvest/Roshen	Poroshenko, Kosiuk, Vadaturskyy	2	18
Nord	Landyk	2	17
Finance and Credit	Zhevago, Kucherenko	2	10
Astarta	Ivanchyk, Korotkov	1	14
Dynamo	Hryhoriy & Ihor Surkis, Medvedchuk	1	13
Interpipe	Pinchuk	1	13
TAS	Tihipko	1	13
Konti/APK-Invest	Kolesnikov	1	11
Obolon	Slobodyan	1	9
Ukrinterproduct	Leshchinsky	1	8
Stirol	Yankovsky	1	8
Creativ Group	Berezkin	1	8
Development Construction Holding	Yaroslavsky	1	8
AVK	Avramenko, Kravets	1	5
Concern AVEC	Feldman	1	3
Aval	Shpig	–	–
Ukrsotsbank	Khoroshkovskyi	–	–
Pravex	Chernovetskyi & his family	–	–
Forum Group	Yurushev	–	–
Uvercon	Prutnik	–	–
Continuum	Eremeev, Lagur, Ivahiv	–	–
EpiCentre K	Oleksandr & Halyna Hereha	–	–
Cascade Investment	Khomutynnik	–	–
Neftegazobycha	Shufrych, Rudkovsky	–	–

Note: this table provides the list of Ukrainian oligarch groups (see criteria in the text). Several firms in the sample are owned by two oligarch groups. Haiduk formally left the Industrial Union of Donbas in 2010, but keeps strong ties with the group; Eremeev deceased in 2015.

market manipulation in Ukraine.

Independent variables include oligarch ownership dummy and firm-level factors. *Oligarch* is a dummy variable that equals 1 if oligarch is controlling owner and 0 otherwise. This variable captures direct effects of oligarch ownership. Notice that the controlling owner does not necessary hold a majority of a company's stock; oligarchs are able to effectively control enterprises even with a small share in ownership. In such a case majority of shares does not carry a vote, leaving control to an oligarch.

OwnOligarch is an additional control for the share of oligarch voting rights. This

Table 2: Variables definition

Acronym	Variable	Construction
DTC	Debt-to-capital ratio	Debt / (Debt + Equity)
LTA	Liabilities-to-assets ratio	Liabilities / Assets
Oligarch	Oligarch dummy	1 if controlling owner, and 0 otherwise
OwnOligarch	Oligarch ownership share	Share of oligarch voting rights
Size	Firm size	Log(Assets, in thousand 2002 year LCU)
Tang	Assets tangibility	Fixed assets (PPE) / Assets
Prof	Profitability	EBIT / Assets
Growth	Growth opportunities	ΔSales / Sales_0 (in 2002 year prices)
Age	Firm age	Number of years since firm establishment or reorganization
MedDTC	Industry median DTC	$\text{Med}_{i,\ i \in (Year,\ Industry)}$ = Med(Year, Industry, -i)
MedLTA	Industry median LTA	

Note: this table provides definitions and construction of the variables used in the study. DTC and LTA are dependent variables; the rest are explanatory variables. See further details in the text.

variable aims to capture effects of oligarch's ownership concentration.

The next four variables (firm size, profitability, tangibility, growth) are classic determinants proposed in Rajan and Zingales (1995). *Size* is measured by deflated firm assets, as the natural logarithm of total assets in 2002-year thousand hryvnias (local currency unit). Base-year prices were calculated according to the deflator from the state statistical data. Size captures both bankruptcy costs and information asymmetry between capital markets and firm managers. Hence, larger firms supposed to have higher leverage. However, politically connected firms could replace the significance of firm size with connections (Saeed et al. 2015).

Profitability (*Prof*) is a return on assets, measured as earnings before interest payments and taxes (EBIT) to assets. Profitability is positively related to leverage in static trade-off theory and negatively related in the pecking order theory. Initial profitability data is influenced by outliers. Thus, the data were winsorized at 1% and 99% levels to account for extreme values.

Tangibility (*Tang*) is assets tangibility, measured as property, plant and equipment (PPE) to assets. Tangibility is a measure of collateral a firm can offer to its creditors, and thus oligarch–owned firms are expected to be less sensitive to firm tangibility.

Growth is a proxy for growth opportunities, measured as the relative change of sales (in 2002-year prices). The growth variable was winsorized at 1% and 99% levels to account for extreme values. In general, high growth opportunities are related to larger information asymmetries and therefore lower indebtedness. However, connected high-growth firms might rely less on debt financing due to preferential credit (Saeed et al. 2017).

Age is firm age, measured as a number of years since firm establishment (or reorganization, if a firm was founded before 1991). Thus, Age equals 0 for newly created companies. Age is an indirect measure of information asymmetry (younger firms face higher asymmetries than well-known on the market). Hence, age supposed to be positively related to leverage

Finally, MedDTC and MedLTA are industry medians (debt-to-capital ratio or liabilities-to-assets ratio, respectively) for each year, which reflect omitted industry-related factors.

However, some industries contain only 10–12 firms[7]. Thus, industry medians are calculated for every firm as industry-year median leverage with own firm excluded.

3.4 Differences across Owners

I start research by comparing differences across oligarch–owned and non-oligarch firms. Table 3 provides descriptive statistics for oligarch–owned and non-oligarch companies, as well as t-test for mean comparison. As expected, oligarch–owned firms tend to raise more debt and liabilities. Furthermore, the differences are statistically significant for all variables except industry median (narrow leverage DTC) and growth. In particular, oligarch–owned firms are larger, older, more profitable, and hold less property, plant, and equipment in their assets[8]. Whereas firm-level factors are clearly different, the effects on capital structure remain unclear without further study.

Table 3: A comparison between oligarch and non-oligarch firms

Statistic	Oligarch (obs. = 595)		Non-oligarch (obs. = 1,745)		t-test
	Average	St. Dev.	Average	St. Dev.	
Debt-to-capital (DTC)	0.218	0.261	0.183	0.249	-2.797^{***}
Liabilities-to-assets (LTA)	0.456	0.256	0.396	0.275	-4.846^{***}
Industry median DTC	0.083	0.057	0.079	0.066	-1.351
Industry median LTA	0.349	0.160	0.292	0.123	-7.859^{***}
OwnOligarch	0.775	0.214	0.005	0.040	87.269^{***}
Size	11.940	1.978	9.453	2.183	-25.775^{***}
Tang (PPE/Assets)	0.412	0.238	0.472	0.256	5.206^{***}
Prof (EBIT/Assets)	0.055	0.140	0.015	0.292	-4.379^{***}
Growth	0.129	0.979	0.072	0.889	-1.237
Age	12.812	4.716	12.428	4.914	-1.698^{*}

Note: this table provides means and Welch two sample t-test for mean comparison (H_0: difference $\neq 0$). (*), (**) and (***) denote 10%, 5%, and 1% levels of significance respectively. See appendix A for more detailed statistics.

4 Empirical Model and Results

4.1 Econometric Model

This study applies the dynamic model of capital structure, based on panel data. Since capital structure choice is dynamic by nature (Flannery and Rangan 2006), such a model seems to be more relevant from a purely theoretical viewpoint. In particular, static framework implies immediate adjustments of capital structure and thus ignores differences in the adjustment process. On the contrary, better access to debt affects re-leveraging process, rather than targets the leverage itself. Strebulaev (2007) suggests that firms refinance only occasionally due to adjustment costs. Furthermore, comparative statics at refinancing points and cross-section dynamics of leverage differ dramatically (Strebulaev 2007). Thus I choose a dynamic framework, leaving traditional static model as a mere

[7]Industries are classified according to international standard industrial classification of all economic activities (Rev.4). See industry composition of the dataset in appendix A.

[8]As mentioned earlier, firm selection during the privatization was not random. Nevertheless, it is not clear to what extent differences between oligarch and non-oligarch firms come from non-random selection of ownership.

robustness check. More precisely, this study employs dynamic partial adjustment model (1), which may be re-written in the following form (2).

$$Leverage_{it} - Leverage_{it-1} = \gamma(Leverage^*_{it} - Leverage_{it-1}) \tag{1}$$

$$Leverage_{it} = (1-\gamma)Leverage_{it-1} + \gamma Leverage^*_{it} \tag{2}$$

$Leverage_{it}$ is one of the dependent variables (DTC or LTA). γ is the parameter for the speed of adjustment ($\gamma > 0$). If $t \to \infty$ then $\gamma = 1$, and therefore $Leverage_{it-1} \to Leverage^*_{it}$. Since adjustment costs are present, any adjustments are not immediate, i.e. $\gamma \in (0, 1)$. The higher these adjustment costs are, the lower parameter γ will be. In other words, firms with lower financial constraints and financing costs are able to rebalance their structures quickly. Rewriting (2) using $\alpha = (1-\gamma)$ yields the following equation (3).

$$Leverage_{it} = \alpha Leverage_{it-1} + (1-\alpha)Leverage^*_{it} \tag{3}$$

Unobservable target debt level is a function of available determinants in this period $x^{'}_{it}$, i.e. $Leverage^*_{it} = f(x^{'}_{it})$. Then, impact of target $f(x^{'}_{it})$ on the leverage is its estimated coefficient divided by adjustment parameter. Assuming a linear relationship gives the model (4).

$$(1-\alpha)Leverage^*_{it} = (1-\alpha)f(x^{'}_{it}) = \beta X^{'}_{it} \tag{4}$$

Finally, the model should take into account panel data structure. Therefore, idiosyncratic error should be a sum of unobserved firm fixed effects μ_i, time fixed effects ν_t, and standard error term ε_{it} (homoskedastic and not serially correlated). Two-ways fixed effects model excludes the possibility of omitted variable bias, caused by any firm-invariant or time factors. Thus, equation (5) presents empirical model for $i \in \{1, ..., n\}$ and $t \in \{1, ..., T\}$.

$$Leverage_{it} = \alpha Leverage_{it-1} + \beta X^{'}_{it} + \nu_t + \mu_i + \varepsilon_{it} \tag{5}$$

Finally, in order to study direct effects I introduce oligarch ownership effects $\theta_{Oligarch}$. In such a model target debt level is a function of oligarch ownership effects $\theta_{Oligarch}$ and firm level-controls $X^{'}_{it}$ (6).

$$Leverage_{it} = \alpha Leverage_{it-1} + \theta_{Oligarch} + \beta X^{'}_{it} + \nu_t + \mu_i + \varepsilon_{it} \tag{6}$$

The model (6) includes both direct and indirect effects of oligarch ownership. Direct effects imply immediate relation between oligarch ownership and target debt level (i.e., oligarch effects $\theta_{Oligarch}$ are statistically significant). On the contrary, indirect relation suggests mediation effects: (1) ownership-specific adjustment parameters α, (2) differences in firm-level characteristics $X^{'}_{it}$, or (3) ownership-specific coefficients β (determinants of capital structure).

Lagged response variables are correlated with the unobserved effects by definition, making standard estimators inconsistent. Furthermore, studentized Koenker Breusch-Pagan tests indicate heteroskedasticity. Thus, generalized method of moments (GMM) is the most appropriate estimator. Furthermore, since sample includes a relatively large number of observations, system (Blundell-Bond) GMM achieves greater efficiency than first-difference GMM. I present empirical results of two-steps system GMM regressions in the next subsection.

4.2 Empirical Results

I start from investigating direct effects of oligarch ownership. Table 4 presents the results of regressions (models 1 and 4). Notice that R-squared is not performed because this concept is valid only for the models fitting the residual sum of squares. The main target variable (*Oligarch*) shows statistically insignificant relation for both debt-to-capital and liabilities-to-assets ratios. This result suggests that there is no direct relation between oligarch ownership and target leverage.

However, models 1 and 4 rely on assumption that oligarch firms' behavior is not dependent on the share of ownership. Thus, I also test additional model (7) with control for a share of oligarch voting rights, *OwnOligarch*. Nevertheless, this variable also turns out to be statistically insignificant (models 2 and 5 in table 4). This result implies that voting share is irrelevant. Furthermore, this confirms the suggestion that oligarchs are able to effectively control enterprises even with a small share of ownership.

$$Leverage_{it} = \alpha Leverage_{it-1} + \theta_{Oligarch} + \vartheta OwnOligarch + \beta X_{it}^{'} + \nu_t + \mu_i + \varepsilon_{it} \quad (7)$$

Next, I test indirect effects of oligarch ownership, caused by ownership-specific coefficients. In order to check equality of coefficients β I introduce interactions between Oligarch dummy and firm-level controls (8). Almost all interactions are statistically insignificant (models 3 and 6 in table 4). The one exception is Oligarch×Tangibility in model 6 (broad leverage LTA). Therefore, main determinants are equally relevant for oligarch and non-oligarch companies, although oligarch–owned firms are less sensitive to the size of collateral in the case of broad leverage. Interpretation seems to be twofold: (1) oligarch–owned firms borrow beyond the creditworthiness due to lower collateral requirements (2) match between larger short-term liabilities and larger current assets. Since the relation is significant for broad leverage only, the latter seems to be the most reasonable explanation.

$$Leverage_{it} = \alpha Leverage_{it-1} + \theta_{Oligarch} + \beta X_{it}^{'} + \kappa X_{it}^{'} Oligarch + \nu_t + \mu_i + \varepsilon_{it} \quad (8)$$

As mentioned earlier, oligarch–owned firms are larger, older, more profitable, and have a lower share of fixed assets. Hence, lower tangibility and larger size partially explain the differences in debt and liabilities. However, higher profitability has the opposite effect. More precisely, positive effects of tangibility and size seem to be alleviated by the negative effect of profitability. Thus, leverage differences remain largely unexplained.

As a further step, I split my dataset into two sub-samples: oligarch–owned firms and non-oligarch firms (table 5). First, the results prove that capital structure determinants are almost equally relevant for oligarch and non-oligarch firms. Size is positively related, whereas tangibility and profitability are negatively related. On the contrary, age and growth are statistically insignificant.

Secondly, main differences are accumulated in the adjustment speeds rather than mediating firm-level factors. In other words, the relation between ownership and leverage is clearly mediated by adjustment parameters Lag.DTC and Lag.LTA. Oligarch-owned firms demonstrate far less stable ratios (DTC 50.9%, LTA 43.9%) than non-oligarch companies (DTC 27.0%, LTA 31.4%). The higher are adjustment costs, the lower will be adjustment speeds. 1.4–1.9 times higher adjustment speeds imply significantly lower adjustment costs of the oligarch–owned firms. Therefore, oligarchs affect capital structure indirectly through lower refinancing costs.

Table 4: Dynamic panel regressions on the main sample

	Dependent variable:					
	Debt-to-capital (DTC)			Liabilities-to-assets (LTA)		
	(1)	(2)	(3)	(4)	(5)	(6)
Lag.DTC	0.688***	0.689***	0.662***			
	(0.086)	(0.086)	(0.099)			
Lag.LTA				0.633***	0.634***	0.604***
				(0.070)	(0.070)	(0.076)
Oligarch	-0.075	-0.106	-0.601	0.018	0.066	-0.070
	(0.074)	(0.079)	(0.477)	(0.054)	(0.052)	(0.465)
OwnOligarch		0.045			-0.086	
		(0.061)			(0.087)	
Size	0.050***	0.049***	0.047***	0.013	0.015	0.012
	(0.017)	(0.017)	(0.017)	(0.012)	(0.012)	(0.014)
Tang	-0.116**	-0.116**	-0.103*	-0.271***	-0.268***	-0.214***
	(0.048)	(0.048)	(0.054)	(0.059)	(0.059)	(0.073)
Prof	-0.309***	-0.308***	-0.334***	-0.597***	-0.593***	-0.593***
	(0.059)	(0.059)	(0.066)	(0.047)	(0.048)	(0.057)
Growth	-0.000	-0.000	-0.004	0.016	0.016	0.010
	(0.016)	(0.016)	(0.025)	(0.017)	(0.017)	(0.025)
Age	-0.007	-0.007	-0.012	-0.022	-0.022	-0.023
	(0.017)	(0.017)	(0.021)	(0.021)	(0.021)	(0.024)
Oligarch×Size			0.043			0.019
			(0.037)			(0.035)
Oligarch×Tang			-0.093			-0.204**
			(0.098)			(0.091)
Oligarch×Prof			0.037			0.022
			(0.150)			(0.080)
Oligarch×Growth			0.017			0.040
			(0.035)			(0.031)
Oligarch×Age			0.004			-0.006
			(0.006)			(0.006)
Firm effects	Yes	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	2,340	2,340	2,340	2,340	2,340	2,340
Obs. used	2,036	2,036	2,036	2,036	2,036	2,036
Wald test	592.33***	593.69***	660.36***	1715.90***	1781.60***	1876.67***
Sargan test	115.28	115.42	120.21*	109.41	111.22	109.76
Breusch-Pagan	395.1***	395.13***	402.01***	353.06***	353.09***	357.96***
AR test (1)	-4.79***	-4.78***	-4.48***	-5.67***	-5.67***	-5.39***
AR test (2)	0.47	0.50	0.47	1.49	1.46	1.30

Note: this table summarizes the results of two-steps system GMM regressions on the main sample. Robust standard errors in parentheses; (*), (**) and (***) denote 10%, 5%, and 1% levels of significance respectively. Selected statistical tests are Wald test, Sargan test, studentized Breusch-Pagan test, and autocorrelation (AR) tests.

Table 5: Dynamic panel regressions on the ownership sub-samples

	Dependent variable:					
	Debt-to-capital (DTC)			Liabilities-to-assets (LTA)		
	(1)	(2)	(3)	(4)	(5)	(6)
	All firms	Oligarch	Non-Oligarch	All firms	Oligarch	Non-Oligarch
Lag.DTC	0.693***	0.491***	0.730***			
	(0.085)	(0.179)	(0.072)			
Lag.LTA				0.629***	0.561***	0.686***
				(0.069)	(0.094)	(0.067)
Size	0.047***	0.046**	0.037**	0.015	0.057**	0.021
	(0.016)	(0.020)	(0.016)	(0.011)	(0.027)	(0.016)
Tang	-0.114**	-0.229**	-0.095*	-0.269***	-0.369***	-0.198***
	(0.047)	(0.113)	(0.054)	(0.057)	(0.058)	(0.064)
Prof	-0.306***	-0.271**	-0.414***	-0.594***	-0.521***	-0.612***
	(0.059)	(0.113)	(0.071)	(0.046)	(0.101)	(0.058)
Growth	0.001	-0.003	-0.003	0.015	0.050**	0.014
	(0.016)	(0.025)	(0.024)	(0.017)	(0.021)	(0.025)
Age	-0.006	-0.005	0.013	-0.021	0.015	0.012
	(0.019)	(0.025)	(0.017)	(0.022)	(0.020)	(0.019)
Firm effects	Yes	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	2,340	595	1,745	2,340	595	1,745
Obs. used	2,036	533	1,503	2,036	533	1,503
Wald test	582.03***	200.73***	709.56***	1782.96***	869.78***	2077.88***
Sargan test	117.01	47.22	117.91	106.71	44.22	109.46
Breusch-Pagan	393.8***	111.82***	276.78***	352.21***	101.59***	278.84***
AR test (1)	-4.84***	-2.35**	-4.18***	-5.65***	-3.07***	-5.07***
AR test (2)	0.50	0.17	0.43	1.49	-1.04	1.82*

Note: this table summarizes the results of two-steps system GMM regressions. Robust standard errors in parentheses; (*), (**) and (***) denote 10%, 5%, and 1% levels of significance respectively. Selected statistical tests are Wald test, Sargan test, studentized Breusch-Pagan test, and autocorrelation (AR) tests.

4.3 Robustness Checks

I conduct an extensive robustness analysis, the main points of which are disclosed here (see regression results in appendix B). I start by checking alternative specifications of the main model, taking into account relevant ones. First, I compute regressions with additional firm level-control for industry effects (industry medians MedDTC and MedLTA, respectively). In both cases, industry medians are statistically insignificant, whereas main results remain the same. However, industry effects seem to be strongly correlated with the other firm-level controls.

Secondly, I exclude time effects from regression. In this case, results remain almost the same as in the main model. On the contrary, exclusion of all firm-level controls leads to significant effects of oligarch ownership on the broad leverage. More precisely, this result appears only in the model with omitted size. This illustrates the importance of firm size, although the overall effect of differences in firm characteristics is fairly small.

Next, I also switch to a traditional static model (two-way fixed effects). In general, static framework reproduces almost all of the conclusions from the dynamic model. Size

is positively related, tangibility and profitability are negatively related, and oligarch variables are statistically insignificant. In contrast, age and growth are positively related and statistically significant in some of the models. However, in this model effects of tangibility, size and age are alleviated by the opposite effect of profitability. Hence, in the static framework differences in the financing of oligarch and non-oligarch firms could not be explained in a sufficient way.

The main results are also robust to the use of alternative estimators, such as instrumental variables regression. In particular, results remain qualitatively the same: in the main model oligarch dummy is statistically insignificant or marginally significant; in subsamples adjustment speeds are higher for oligarch–owned firms. Although the difference between adjustment speeds is much lower than in GMM regression, it is still significant. In contrast, Oligarch–Tangibility interaction is statistically insignificant for both narrow and broad leverage measures. In addition, Oligarch–Prof interaction appears to be marginally significant in relation with DTC, but this relation is not supported by the evidence from ownership sub-samples.

Finally, I check whether outliers could have any effect on the final results. Profitability and growth are influenced by outliers and thus were winsorized in the previous section. I compute additional regressions with outliers present (i.e., non-winsorized variables). In short, results remain qualitatively the same, although affected variables show somewhat higher coefficients.

In addition, I truncate debt-to-capital dependent variable to account for extreme values (0 and 1). There are a lot of zero-debt firms (678 observations with DTC = 0), and thus trimmed variable has somewhat higher statistics (mean 0.270, st.dev. 0.261, median 0.186). However, regressions with trimmed dependent variable also demonstrate almost the same results.

5 Concluding Remarks

This study examined the effects of oligarch ownership on capital structure policies under the emerging market environment (Ukraine). My sample includes 26 out of 35 oligarchic groups, which can be identified over the period of 2002–2016. Overall coverage is 2,340 firm-year observations from 250 Ukrainian firms.

I found that oligarch–owned firms raise more debt and liabilities than their peers, although there is no direct relation between oligarch ownership and target capital structure. Furthermore, main determinants are almost equally relevant for oligarch and non-oligarch owned companies. Differences in firm characteristics (and specifically in firm size) also explain only a small share of leverage variation.

Whereas the determinants of target leverage are similar, oligarch–owned firms have significantly higher adjustment speeds, and this result is consistent with several robustness tests. More precisely, oligarch–owned firms may rebalance their capital structures more frequently due to better access to loans, caused by group affiliations and political connections. In sum, influential ownership is positively related to capital structure. Oligarch–owned firms benefit from their accumulated advantages, while the others might suffer from credit rationing imposed by oligarch–owned banks. Such distortions could be the cause of macro-level path dependence in the long-term. Hence, any efforts to suppress insider lending should be welcomed.

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Appendices

Appendix A. Detailed Dataset Statistics

Table 6: Industry structure of the dataset

Industry	ISIC Code	Number of firms			Number of observations		
		All firms	Oligarch	Non-oligarch	All firms	Oligarch	Non-oligarch
Agriculture	A	26	5	23	229	52	177
Mining	B	12	5	11	113	63	50
Food	C10-12	29	9	21	237	81	156
Apparel	C13-15	14	–	14	117	–	117
Wood	C16-17,31	10	1	9	108	7	101
Chemical	C19-22	13	3	10	121	25	96
ConstrMaterials	C22-23	12	1	12	107	9	98
Metallurgy	C24-25	13	11	4	151	121	30
Electronic	C26-27	13	4	9	131	45	86
Machinery	C28-30,33	28	7	21	292	57	235
Utilities	D, E	12	7	8	152	69	55
Construction	F	23	1	22	216	5	211
Trade	G	20	2	18	176	26	150
Transport	H	14	1	14	107	15	96
Other	I, J, L-T	11	3	10	95	20	87
		250	60	206	2,352	595	1,745

Note: this table presents industry structure statistics. Industries are classified according to international standard industrial classification (ISIC, Rev.4) of all economic activities. "Other" category includes other non-specified activities, such as information and communication, services, professional, scientific and technical, real estate activities. Notice that for 16 firms (6.4%) controlling owner has changed in 2002-2016.

Table 7: Time structure of the dataset

Year	Number of observations (dataset)				Number of all public companies
	All firms	Oligarch	Non-oligarch	(% olig.-owned)	
2002	142	28	114	(19.7)	12,137
2003	180	37	143	(20.6)	11,906
2004	193	42	151	(21.8)	11,730
2005	192	45	147	(23.4)	11,345
2006	188	50	138	(26.6)	10,895
2007	192	48	144	(25.0)	10,406
2008	182	48	134	(26.4)	10,058
2009	160	45	115	(28.1)	9,480
2010	116	32	84	(27.6)	7,962
2011	143	35	108	(24.5)	4,649
2012	155	39	116	(25.2)	3,482
2013	157	46	111	(29.3)	3,637
2014	141	40	101	(28.4)	3,490
2015	128	37	91	(28.9)	3,486
2016	71	23	48	(32.4)	3,122
	2,340	595	1,745	(25.4)	

Note: this table presents term structure of the dataset (see selection criteria in the text). Number of public companies (both financial and non-financial, active and shell companies) comes from state statistical data.

Table 8: Descriptive statistics of variables

Statistic	Mean	St. Dev.	Min	Median	Max
Panel A: All firms (obs. = 2,340)					
Oligarch (dummy)	0.254	0.436	0	0	1
OwnOligarch	0.201	0.354	0.000	0.000	0.997
DTC	0.192	0.252	0.000	0.070	1.000
LTA	0.411	0.272	0.000	0.380	1.000
Size	10.086	2.392	3.935	9.787	16.454
Tang	0.457	0.253	0.000	0.447	1.000
Prof	0.025	0.263	−10.620	0.019	1.507
Prof (regr. input)	0.030	0.134	−0.851	0.019	0.862
Growth	0.087	0.913	−1.042	−0.002	25.140
Growth (regr. input)	0.047	0.293	−0.556	−0.002	1.748
Age	12.525	4.866	0	12	25
MedDTC	0.080	0.064	0.000	0.068	0.356
MedLTA	0.307	0.135	0.095	0.254	0.790
Panel B: Oligarch-owned firms (obs. = 595)					
OwnOligarch	0.775	0.214	0.137	0.838	0.997
DTC	0.218	0.261	0.000	0.107	0.961
LTA	0.456	0.256	0.000	0.458	0.993
Size	11.940	1.978	4.781	12.021	16.161
Tang	0.412	0.238	0.000	0.395	1.000
Prof	0.055	0.140	−0.484	0.038	1.507
Prof (regr. input)	0.054	0.131	−0.484	0.038	0.862
Growth	0.129	0.979	−0.749	−0.001	19.200
Growth (regr. input)	0.074	0.333	−0.556	−0.001	1.748
Age	12.812	4.716	0	13	23
MedDTC	0.083	0.057	0.004	0.079	0.356
MedLTA	0.349	0.160	0.095	0.282	0.790
Panel C: Non-oligarch owners (obs. = 1,745)					
OwnOligarch	0.005	0.040	0.000	0.000	0.485
DTC	0.183	0.249	0.000	0.060	1.000
LTA	0.396	0.275	0.000	0.347	1.000
Size	9.453	2.183	3.935	9.073	16.454
Tang	0.472	0.256	0.000	0.474	0.987
Prof	0.015	0.292	−10.620	0.014	0.877
Prof (regr. input)	0.022	0.135	−0.851	0.014	0.862
Growth	0.072	0.889	−1.042	−0.002	25.140
Growth (regr. input)	0.038	0.277	−0.556	−0.002	1.748
Age	12.428	4.914	0	12	25
MedDTC	0.079	0.066	0.000	0.068	0.328
MedLTA	0.292	0.123	0.095	0.248	0.703

Note: this table presents descriptive statistics of debt-to-capital (DTC), liabilities-to-assets ratio (LTA), and explanatory variables. See table 2 for variables' definitions. In order to alleviate the influence of outliers, Prof and Growth were winsorized before regression analysis.

Appendix B. Robustness Checks

This appendix discloses the following robustness checks (see text for the further details):

Table 9: alternative specifications;

Tables 10 and 11: traditional static model;

Tables 12 and 13: instrumental variables regression;

Tables 14 and 15: regressions with outliers (non-winsorized independent variables);

Tables 16: Regressions using the trimmed dependent variable DTC (debt-to-capital).

Table 9: Alternative specifications (main sample)

	Dependent variable:							
	Debt-to-capital (DTC)				Liabilities-to-assets (LTA)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lag.DTC	0.676***	0.686***	0.827***	0.706***				
	(0.097)	(0.073)	(0.057)	(0.074)				
Lag.LTA					0.594***	0.669***	0.979***	0.724***
					(0.086)	(0.061)	(0.032)	(0.068)
Oligarch	-0.088	-0.050	0.075	-0.021	0.044	-0.022	0.084**	0.020
	(0.077)	(0.064)	(0.054)	(0.059)	(0.048)	(0.056)	(0.034)	(0.034)
Size	0.058***	0.020***		0.014***	0.024	0.030***		0.021***
	(0.019)	(0.005)		(0.005)	(0.015)	(0.004)		(0.004)
Tang	-0.116***	-0.159***			-0.255***	-0.287***		
	(0.043)	(0.045)			(0.059)	(0.058)		
Prof	-0.309***	-0.306***			-0.589***	-0.561***		
	(0.057)	(0.062)			(0.047)	(0.047)		
Growth	-0.004	-0.007			0.016	0.015		
	(0.016)	(0.017)			(0.016)	(0.016)		
Age	-0.009	0.002			-0.040	0.004**		
	(0.026)	(0.001)			(0.033)	(0.002)		
MedDTC	-2.218							
	(1.429)							
MedLTA					-0.906			
					(0.606)			
Firm effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	No	No	No	Yes	No	No	No
Obs. used	2,036	2,036	2,036	2,036	2,036	2,036	2,036	2,036
Wald test	592.47***	467.01***	263.27***	431.14***	962.20***	1461.57***	1100.11***	1242.79***
Sargan test	105.89	113.71	111.3	117.37	105.41	115.67	119.61	118.93

Note: this table summarizes the results of two-steps system GMM regressions. Robust standard errors in parentheses; (*), (**) and (***) denote 10%, 5%, and 1% levels of significance respectively.

Table 10: Static model (main sample)

	Dependent variable:					
	Debt-to-capital (DTC)			Liabilities-to-assets (LTA)		
	(1)	(2)	(3)	(4)	(5)	(6)
Oligarch	0.040	0.114	-0.147	0.038	0.101	-0.103
	(0.058)	(0.079)	(0.327)	(0.061)	(0.094)	(0.334)
OwnOligarch		-0.109			-0.094	
		(0.079)			(0.106)	
Size	0.051***	0.051***	0.048***	0.021	0.021	0.019
	(0.014)	(0.014)	(0.015)	(0.021)	(0.021)	(0.024)
Tang	-0.108**	-0.108**	-0.097*	-0.274***	-0.274***	-0.274***
	(0.045)	(0.045)	(0.055)	(0.057)	(0.057)	(0.071)
Prof	-0.289***	-0.293***	-0.296***	-0.466***	-0.469***	-0.469***
	(0.049)	(0.048)	(0.061)	(0.048)	(0.048)	(0.060)
Growth	-0.008	-0.008	-0.010	0.043***	0.043***	0.036**
	(0.013)	(0.013)	(0.015)	(0.013)	(0.013)	(0.017)
Age	0.006**	0.006**	0.006**	0.010***	0.011***	0.011***
	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.004)
Oligarch×Size			0.019			0.015
			(0.025)			(0.027)
Oligarch×Tang			-0.045			-0.001
			(0.087)			(0.113)
Oligarch×Prof			0.013			-0.010
			(0.102)			(0.094)
Oligarch×Growth			0.002			0.015
			(0.028)			(0.024)
Oligarch×Age			-0.002			-0.004
			(0.005)			(0.005)
Firm effects	Yes	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
Obs. used	2,340	2,340	2,340	2,340	2,340	2,340
R^2	0.116	0.118	0.118	0.205	0.206	0.207
Adj. R^2	0.109	0.110	0.109	0.198	0.199	0.199
F-test	6.18***	6.04***	5.77***	11.93***	11.59***	10.76***

Note: this table summarizes the results of fixed effects panel regressions. Robust standard errors in parentheses; (*), (**) and (***) denote 10%, 5%, and 1% levels of significance respectively.

Table 11: Static model (ownership sub-samples)

	Dependent variable:					
	Debt-to-capital (DTC)			Liabilities-to-assets (LTA)		
	(1)	(2)	(3)	(4)	(5)	(6)
	All firms	Oligarch	Non-Oligarch	All firms	Oligarch	Non-Oligarch
Size	0.051***	0.091***	0.044**	0.021	0.052**	0.016
	(0.014)	(0.022)	(0.017)	(0.021)	(0.022)	(0.027)
Tang	-0.107**	-0.128*	-0.116**	-0.273***	-0.243***	-0.294***
	(0.045)	(0.069)	(0.055)	(0.058)	(0.089)	(0.071)
Prof	-0.284***	-0.224***	-0.301***	-0.461***	-0.438***	-0.471***
	(0.049)	(0.069)	(0.061)	(0.048)	(0.070)	(0.059)
Growth	-0.007	-0.011	-0.008	0.043***	0.048**	0.037**
	(0.013)	(0.023)	(0.016)	(0.013)	(0.021)	(0.017)
Age	0.006**	0.008*	0.004	0.011***	0.012**	0.010***
	(0.002)	(0.004)	(0.003)	(0.003)	(0.005)	(0.004)
Firm effects	Yes	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
Obs. used	2,340	595	1,745	2,340	595	1,745
R^2	0.115	0.170	0.121	0.204	0.228	0.217
Adj. R^2	0.108	0.144	0.111	0.198	0.204	0.209
F-test	6.42***	4.21***	5.26***	12.37***	7.47***	10.30***

Note: this table summarizes the results of fixed effects panel regressions. Robust standard errors in parentheses; (*), (**) and (***) denote 10%, 5%, and 1% levels of significance respectively.

Table 12: Instrumental variables regressions (main sample)

	Dependent variable:					
	Debt-to-capital (DTC)			Liabilities-to-assets (LTA)		
	(1)	(2)	(3)	(4)	(5)	(6)
Lag.DTC	0.604***	0.605***	0.602***			
	(0.052)	(0.052)	(0.052)			
Lag.LTA				0.697***	0.696***	0.697***
				(0.031)	(0.031)	(0.031)
Oligarch	0.063*	0.021	-0.229	0.045*	0.090	-0.065
	(0.039)	(0.054)	(0.225)	(0.026)	(0.069)	(0.270)
OwnOligarch		0.058			-0.062	
		(0.075)			(0.088)	
Size	0.027**	0.027**	0.021*	0.023*	0.023*	0.021
	(0.012)	(0.012)	(0.012)	(0.014)	(0.014)	(0.015)
Tang	-0.126***	-0.126***	-0.099**	-0.188***	-0.188***	-0.172***
	(0.033)	(0.033)	(0.041)	(0.033)	(0.033)	(0.041)
Prof	-0.324***	-0.323***	-0.368***	-0.535***	-0.536***	-0.560***
	(0.046)	(0.046)	(0.069)	(0.034)	(0.034)	(0.086)
Growth	0.008	0.008	-0.003	0.064***	0.064***	0.058***
	(0.016)	(0.016)	(0.017)	(0.015)	(0.015)	(0.018)
Age	0.001	0.001	0.000	0.005***	0.005***	0.005**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Oligarch×Size			0.025			0.012
			(0.018)			(0.022)
Oligarch×Tang			-0.100			-0.059
			(0.066)			(0.061)
Oligarch×Prof			0.093*			0.067
			(0.055)			(0.071)
Oligarch×Growth			0.028			0.012
			(0.034)			(0.031)
Oligarch×Age			0.002			-0.001
			(0.003)			(0.003)
Firm effects	Yes	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
Obs. used	1,743	1,743	1,743	1,743	1,743	1,743
Wald test	769.13***	774.01***	843.20***	1713.30***	1707.63***	1795.90***

Note: this table summarizes the results of instrumental variables regressions. Robust standard errors in parentheses; (*), (**) and (***) denote 10%, 5%, and 1% levels of significance respectively.

Table 13: Instrumental variables regressions (ownership sub-samples)

	Dependent variable:					
	Debt-to-capital (DTC)			Liabilities-to-assets (LTA)		
	(1)	(2)	(3)	(4)	(5)	(6)
	All firms	Oligarch	Non-Oligarch	All firms	Oligarch	Non-Oligarch
Lag.DTC	0.606***	0.540***	0.623***			
	(0.051)	(0.086)	(0.062)			
Lag.LTA				0.698***	0.653***	0.707***
				(0.031)	(0.055)	(0.038)
Size	0.027**	0.064***	0.016	0.024*	0.045*	0.016
	(0.012)	(0.020)	(0.012)	(0.014)	(0.025)	(0.015)
Tang	-0.125***	-0.187***	-0.101**	-0.188***	-0.201***	-0.181***
	(0.033)	(0.058)	(0.040)	(0.033)	(0.049)	(0.043)
Prof	-0.318***	-0.265***	-0.361***	-0.531***	-0.464***	-0.573***
	(0.046)	(0.076)	(0.056)	(0.034)	(0.059)	(0.039)
Growth	0.009	0.033	-0.002	0.065***	0.071***	0.056***
	(0.016)	(0.027)	(0.018)	(0.015)	(0.025)	(0.019)
Age	0.001	0.006*	-0.001	0.005***	0.006**	0.005**
	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)
Firm effects	Yes	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
Obs. used	1,743	470	1,273	1,743	470	1,273
Wald test	774.42***	405.18***	633.36***	1747.32***	724.72***	1425.46***

Note: this table summarizes the results of instrumental variables regressions. Robust standard errors in parentheses; (*), (**) and (***) denote 10%, 5%, and 1% levels of significance respectively.

Table 14: Regressions with outliers (main sample)

	Dependent variable:					
	Debt-to-capital (DTC)			Liabilities-to-assets (LTA)		
	(1)	(2)	(3)	(4)	(5)	(6)
Lag.DTC	0.694***	0.695***	0.672***			
	(0.087)	(0.088)	(0.103)			
Lag.LTA				0.646***	0.648***	0.613***
				(0.071)	(0.071)	(0.076)
Oligarch	-0.071	-0.087	-0.502	0.019	0.069	0.108
	(0.078)	(0.082)	(0.488)	(0.051)	(0.054)	(0.434)
OwnOligarch		0.026			-0.082	
		(0.061)			(0.086)	
Size	0.049***	0.049***	0.045***	0.017	0.019	0.018
	(0.015)	(0.015)	(0.016)	(0.012)	(0.012)	(0.015)
Tang	-0.106**	-0.106**	-0.096*	-0.252***	-0.249***	-0.188**
	(0.049)	(0.049)	(0.056)	(0.066)	(0.066)	(0.081)
Prof	-0.230***	-0.230***	-0.268***	-0.407***	-0.402***	-0.412***
	(0.058)	(0.058)	(0.074)	(0.074)	(0.073)	(0.089)
Growth	-0.002	-0.002	0.000	-0.002	-0.002	-0.001
	(0.005)	(0.005)	(0.007)	(0.006)	(0.006)	(0.007)
Age	-0.004	-0.004	-0.010	-0.013	-0.012	-0.015
	(0.016)	(0.017)	(0.024)	(0.019)	(0.019)	(0.023)
Oligarch×Size			0.038			0.008
			(0.037)			(0.032)
Oligarch×Tang			-0.092			-0.237**
			(0.094)			(0.102)
Oligarch×Prof			0.095			0.027
			(0.155)			(0.149)
Oligarch×Growth			-0.008			-0.002
			(0.010)			(0.016)
Oligarch×Age			0.003			-0.008
			(0.006)			(0.005)
Firm effects	Yes	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
Obs. used	2,036	2,036	2,036	2,036	2,036	2,036
Wald test	555.99***	552.27***	593.00***	1761.09***	1856.04***	1846.65***
Sargan test	112.47	112.31	117.56	105.17	106.40	104.92

Note: this table summarizes the results of two-steps system GMM regressions with outliers (non-winsorized variables Growth and Prof). Robust standard errors in parentheses; (*), (**) and (***) denote 10%, 5%, and 1% levels of significance respectively.

Table 15: Regressions with outliers (ownership sub-samples)

	Dependent variable:					
	Debt-to-capital (DTC)			Liabilities-to-assets (LTA)		
	(1)	(2)	(3)	(4)	(5)	(6)
	All firms	Oligarch	Non-Oligarch	All firms	Oligarch	Non-Oligarch
Lag.DTC	0.698***	0.518***	0.730***			
	(0.086)	(0.185)	(0.072)			
Lag.LTA				0.644***	0.596***	0.693***
				(0.070)	(0.192)	(0.067)
Size	0.047***	0.050**	0.040**	0.020*	0.048*	0.023
	(0.015)	(0.024)	(0.016)	(0.011)	(0.026)	(0.015)
Tang	-0.105**	-0.209*	-0.069	-0.251***	-0.356***	-0.167**
	(0.048)	(0.107)	(0.052)	(0.063)	(0.130)	(0.068)
Prof	-0.230***	-0.162	-0.288***	-0.407***	-0.369***	-0.419***
	(0.058)	(0.162)	(0.072)	(0.072)	(0.103)	(0.100)
Growth	-0.001	-0.010**	-0.001	-0.002	-0.008	-0.000
	(0.005)	(0.004)	(0.006)	(0.006)	(0.014)	(0.006)
Age	-0.003	0.000	0.015	-0.011	0.006	0.013
	(0.018)	(0.029)	(0.018)	(0.020)	(0.018)	(0.020)
Firm effects	Yes	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
Obs. used	2,036	533	1,503	2,036	533	1,503
Wald test	541.58***	250.18***	624.39***	1817.82***	839.50***	1754.67***
Sargan test	113.46	50.39	102.37	103.14	45.05	110.58

Note: this table summarizes the results of two-steps system GMM regressions with outliers (non-winsorized variables Growth and Prof). Robust standard errors in parentheses; (*), (**) and (***) denote 10%, 5%, and 1% levels of significance respectively.

Table 16: Regressions using the trimmed dependent variable

	Dependent variable: trimmed debt-to-capital (DTC)					
	Main sample (all firms)				Oligarch	Non-Oligarch
	(1)	(2)	(3)	(4)	(5)	(6)
Lag.DTC (trimmed)	0.645***	0.644***	0.627***	0.646***	0.493***	0.611***
	(0.078)	(0.078)	(0.071)	(0.078)	(0.150)	(0.084)
Oligarch	-0.030	-0.036	-0.270			
	(0.086)	(0.091)	(0.532)			
OwnOligarch		0.008				
		(0.068)				
Size	0.047*	0.048*	0.050*	0.049*	0.077*	0.043*
	(0.027)	(0.027)	(0.028)	(0.028)	(0.043)	(0.023)
Tang	-0.154**	-0.156**	-0.117	-0.155**	-0.181*	-0.117
	(0.068)	(0.069)	(0.094)	(0.067)	(0.108)	(0.080)
Prof	-0.380***	-0.381***	-0.408**	-0.380***	-0.423***	-0.365***
	(0.126)	(0.126)	(0.167)	(0.126)	(0.137)	(0.140)
Growth	-0.010	-0.010	-0.017	-0.009	-0.008	0.004
	(0.007)	(0.007)	(0.022)	(0.007)	(0.010)	(0.024)
Age	-0.017	-0.016	-0.015	-0.017	-0.010	-0.003
	(0.021)	(0.022)	(0.021)	(0.021)	(0.035)	(0.017)
Oligarch×Size			0.032			
			(0.040)			
Oligarch×Tang			-0.158			
			(0.143)			
Oligarch×Prof			-0.074			
			(0.212)			
Oligarch×Growth			0.010			
			(0.023)			
Oligarch×Age			-0.009			
			(0.007)			
Firm effects	Yes	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
Obs. used	1,340	1,340	1,340	1,340	396	944
Wald test	586.39***	582.50***	647.84***	561.18***	274.35***	587.27***
Sargan test	88.32	88.37	86.17	87.94	36.26	83.13

Note: this table summarizes the results of two-steps system GMM regressions using the trimmed dependent variable DTC. Robust standard errors in parentheses; (*), (**) and (***) denote 10%, 5%, and 1% levels of significance respectively.