

# Crony Capitalism in Ukraine

## Relationship between Political Connectedness and Firms' Performance

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## Abstract

This study combines firm-level data and data on politically exposed people to explore correlation between firms' political connectedness and their economic performance in Ukraine. First, it estimates the share of politically connected firms in Ukraine's economy. Second, the study looks at how different the performance of politically connected firms is from that of their nonconnected peers. The analysis finds that 2 percent of firms are politically connected, but they control over 20 percent of the total turnover and over 25 percent of the assets of all Ukrainian companies. Over the

past two decades, politically connected firms used various channels to access economic rents: public procurement, subsidized loans, transfers from the budget, trade regulations that restrict imports, privileged access to state assets through privatizations, and beneficial tax regimes. There is a strong negative correlation between political connection and productivity. Politically connected firms are larger and employ more people, but they are less productive and grow slower in turnover and job creation. This may likely account for lower economic growth and less competitive economy.

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# Crony Capitalism in Ukraine: Relationship between Political Connectedness and Firms' Performance

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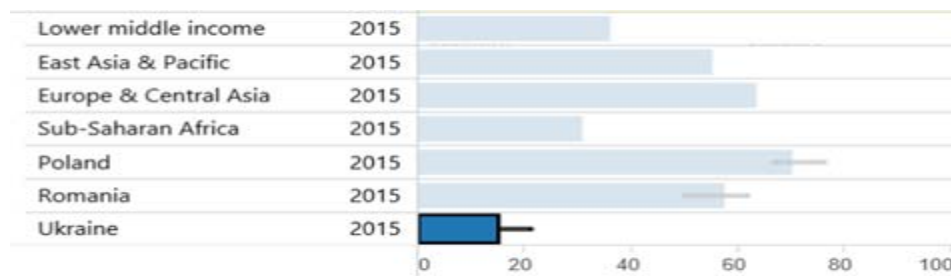
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## INTRODUCTION

Ukraine scores closer to the world's poorest economies on most measures of perceived corruption than it does to the European Union, which it aspires to join. Ukraine was ranked in the 20th percentile worldwide in the World Governance Indicators (WGI) Control of Corruption indicator in 2016, well below Poland, Romania, and averages for lower-middle-income countries and Sub-Saharan Africa. Transparency International's 2016 Corruption Perception Index (CPI) ranked Ukraine 131st out of 167 countries; only Kyrgyzstan, Tajikistan, Uzbekistan and Turkmenistan in the Europe and Central Asia region performed worse. Various attempts have been made to quantify the cost of corruption in Ukraine, with estimates ranging from 4 to 10 percent of GDP annually between 2007-2011.<sup>1</sup>

**Figure 1. Control of Corruption Ukraine vs comparators**



Source: World Governance Indicators

In this paper we focus on rent seeking as distinct from corruption. Rent seeking is the manipulation of public institutions to obtain economic rent – the portion of income paid to a factor of production in excess of what is needed to keep it employed in its current use – without the creation of new wealth. The conventional definition of corruption assumes that it is always a crime.<sup>2</sup> Rent seeking is sometimes legal. Both corruption and rent seeking misappropriate public resources for personal benefit to the detriment of society. In Ukraine, rent seeking includes the award of public resources to companies through tax exemptions, direct subsidies and procurement contracts to connected companies<sup>3</sup> that cannot be justified in terms of the economic benefits to society as a whole. The rent seeking activities provide a basis for the existence of so-called “crony capitalism”.

We call the model of economic governance in which policy decisions are subject to undue influence of a small number of businesses “crony capitalism” following the definitions of Khatri (2016) and Kang (2002). Crony capitalism allows politically connected businesses to enjoy benefits that other companies cannot access. It allows politically connected businesses to create barriers to entry in those sectors where they operate. As a result, crony capitalism allocates resources inefficiently, restricts competition, increases economic costs and limits economic opportunity.

<sup>1</sup> Ministry of Economic Development estimates, Lunina & Vincentz (1998), Legeida (2001), IER/GAG (2004), Fritz (2007), Betliy & Kravchuk (2012), Aslund (2015). Estimates are taken from a number of different sources and methodologies that vary considerably, which does not allow a direct comparison.

<sup>2</sup> The United Nations Convention on Corruption defines corruption in terms of the following criminal offenses and predicate crimes: bribery; embezzlement, misappropriation or other diversion of property; trading of influence; abuse of functions; illicit enrichment; laundering of the proceeds of crime; concealment; and obstruction of justice.

<sup>3</sup> As opposed to the practice of “kickbacks” for awarding procurement contracts, which would qualify as corruption.

In Ukraine, the unusually high concentration of capital allows a small number of businesses to exercise undue influence on public policy. The so-called “oligarchs” dominate key sectors of the Ukrainian economy through their ownership of businesses in banking, steel manufacturing and trade in agricultural commodities. Dominant businesses are usually politically connected. They are able to exert influence on public policy through their representation in political parties, in the legislature and in government. As a result, decisions that impact the allocation of public resources are not made in the public interest.

This paper estimates the economic cost of crony capitalism in Ukraine. The paper seeks to answer three questions. First, the paper seeks to assess the extent to which economic interests are politically connected, which sectors are prone to crony capitalism and how crony capitalism has evolved over time. Second, it explores how the benefits of crony capitalism are realized based on two case studies. Third, it assesses the economic impact of crony capitalism by comparing the economic outcomes of politically connected vs non-connected firms.

## MEASURING CRONY CAPITALISM: IDENTIFYING POLITICAL CONNECTIONS

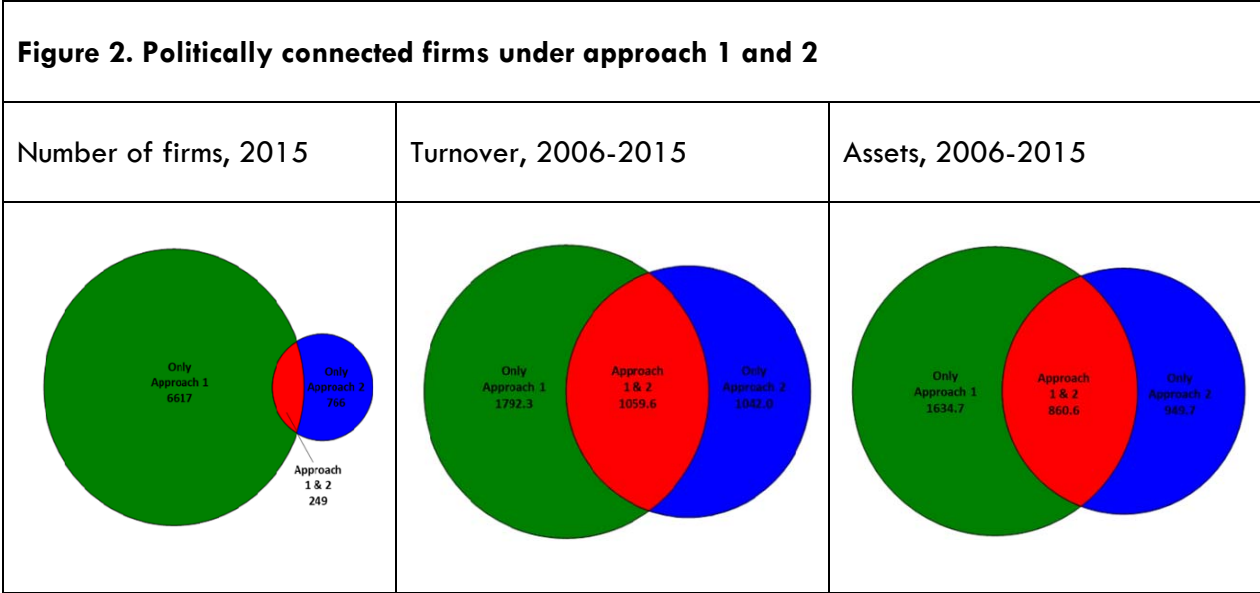
If we are to assess the impact of crony capitalism in Ukraine, we must first define political connection and distinguish politically-connected firms from non-connected firms. Political connectedness of firms is not easy to establish. Oligarchs and large business groups typically use complex ownership structures involving multiple and various corporate vehicles, sometimes with minority interests, to exert de-facto control of firms. Similarly, oligarchs and large business groups use a variety of channels to exert influence on the policy process. We use two approaches to identify politically connected firms.

The first approach is based on publicly available information on the ownership and control of businesses by politically exposed persons. A firm is considered connected if it has at least one politically exposed person (PEP) among its owners, shareholders or managers. A PEP is a person who has been entrusted with prominent public functions, including senior politicians and party officials, senior government, judicial or military officials, and senior executives of state-owned corporations. The Ruslana database of Bureau van Dijk comprises firm-level data on ultimate ownership, shareholders, management and financial data of companies. Using this approach politically connected firms are established by matching these databases and cleaning for “false positives” - owners whose name coincides with PEP but who are not PEPs themselves. Details of the definition of politically connected companies are presented in Annex 2.

The second approach is not as broad, as it does not include all the PEPs, but it allows to include companies that are not formally controlled by PEPs, but enjoy a political connection through an oligarch or a business group they belong to. We use the Ruslana database and journalist investigations from open sources to identify business groups and firms that belong to these groups. We also draw on investigative reporting to identify links between the owners of business groups and officials in key state institutions: the Verkhovna Rada (Parliament), Presidential Administration, Cabinet of Ministers, Ministries and other bodies. Investigative journalism can also be used to track political connections of business groups over time. Use of the second approach results in focus on firms which belong to large business groups, i.e. firms under control of oligarchs. Details of the definition of politically connected companies under the second approach are presented in Annex 2.

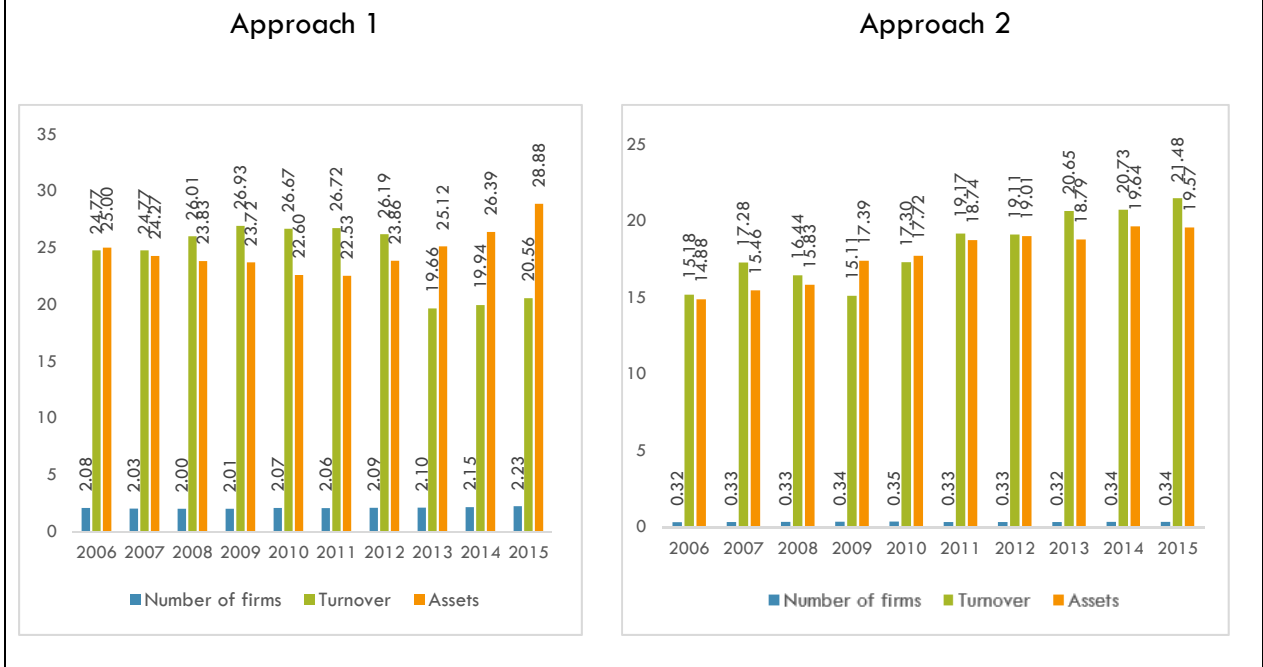
We construct range estimates for politically connected firms using both approaches. While the first approach is easily verifiable and identified more politically connected firms, the second approach

provides additional identification of a number of politically connected firms, which are controlled by oligarchs but may not have a formal link to them. For example, the second approach identifies a firm as politically connected if a member of parliament belongs to a parliamentary group controlled by an oligarch and as such is likely to vote in favor of that business group’s interests. This approach identifies connections that may be difficult to verify and so may overstate the extent to which some firms are politically connected. The actual extent of politically connected firms is likely close to a sum of firms identified under approach one and a portion of firms identified under approach two. The Venn diagrams below show the overlap of the two approaches.



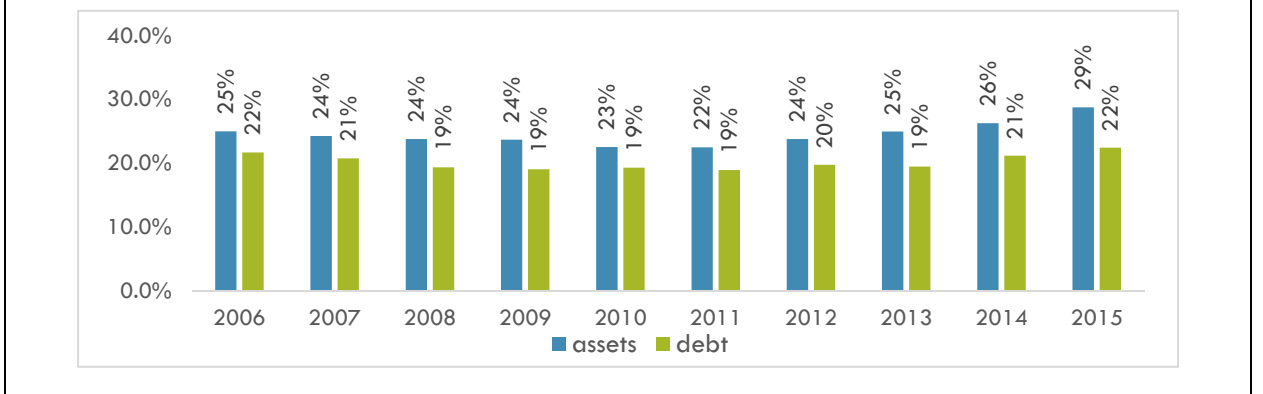
The share of connected firms in Ukraine’s economy is sizeable under both approaches. Between half a percent and 2 percent of the total number of firms in Ukraine are politically connected. However, politically connected firms controlled over 20 percent of the total turnover of all Ukrainian companies under both approaches.

**Figure 3. Share of connected firms in Ukrainian economy, percent**



Politically connected firms have captured an increasingly large share of assets over the last five years (Fig. 3). Based on strict ownership and control criteria under the first approach, politically connected firms representing less than 1 percent of the total number of firms have accessed over one-fifth of debt financing for all firms and account for over one-quarter of all assets (Fig. 4).

**Figure 4. Share of assets and debt of connected firms, Approach 1**



Politically connected firms tend to operate in capital intensive industries. Politically connected firms as defined under the first approach are most prominent in the mining, energy and transport sectors where they account for over 40 percent of turnover and over half of all assets. Politically

connected firms also account for around a quarter of turnover and assets in agriculture, mostly concentrated in grain production and export.

**Table 1. Presence of connected firms in sectors, 2015, Approach 1**

% of connected firms in 2015 in ...	number	turnover	labor	assets
A - Agriculture, hunting and forestry	2.7%	24.1%	17.3%	27.5%
B - Fishing	1.9%	1.7%	4.3%	2.6%
C - Mining and quarrying	3.6%	64.7%	49.7%	65.2%
D - Manufacturing	2.7%	20.4%	17.3%	24.2%
E - Electricity, gas and water supply	3.8%	41.9%	39.1%	63.8%
F - Construction	2.0%	5.7%	6.8%	5.6%
G - Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	1.8%	8.9%	6.8%	13.9%
H - Hotels and restaurants	1.5%	1.5%	3.1%	6.2%
I - Transport, storage and communications	2.0%	41.0%	44.3%	58.6%
J - Financial intermediation	2.7%	2.7%	6.5%	3.7%
K - Real estate, renting and business activities	2.1%	15.2%	7.3%	14.9%
L - Public administration and defence; compulsory social security	2.7%	3.4%	3.6%	4.8%
M - Education	1.6%	1.8%	2.7%	10.6%
N - Health and social work	1.9%	5.1%	5.9%	4.5%
O - Other community, social and personal service activities	2.0%	25.3%	6.4%	13.7%
P - Private households with employed persons	0.0%	0.0%	0.0%	0.0%
Q - Extra-territorial organizations and bodies	0.0%	0.0%	0.0%	0.0%

## HOW POLITICAL CONNECTION BENEFITS ARE REALIZED

Politically connected firms in Ukraine have evolved since independence. The first stage, from 1991 to the late 1990s, saw mass privatization and the establishment of regional business groups connected with regional authorities. The second stage, from the late 1990s to 2002, saw the strengthening of regional groups, a process of legitimizing asset ownership of financial and industrial groups, and the launch of large-scale privatization, notably in the energy sector. During the third stage, from 2003 to 2010, financial and industrial groups entered international markets, and this led to the integration and formalization of business structures. The fourth stage, from 2010 to 2013, the period of Yanukovich's rule, saw the concentration of political influence in the hands of a few oligarchic groups. During the fifth stage, from 2014 until now, several oligarchic groups lost their assets but connections between the state authorities and oligarchic groups have been largely preserved.

Politically connected groups use various channels to access economic rents. These include: public procurement; subsidized loans from state-owned banks; state debt guarantees; state aid in the form of direct transfers from the state budget; price differentials and discounts; trade regulations that restrict imports; privileged access to state assets through privatizations; tax exemptions; beneficial tax regimes; and access to concessional development finance.

Here we explore two case studies that shed some light on how political connections are used to access economic rents. We first focus on the VAT refunds in the period 2014-2016. The second case study explores the case of the air transport monopoly.

### VAT REFUNDS – HOW CONNECTED FIRMS BENEFIT

The management of VAT refunds has been a governance and business environment concern in Ukraine for years. Delayed refunds impose additional costs on exporters and reduce their competitiveness by preventing access to part of their operating capital. The stock of non-refunded



VAT claims amounted to UAH 21.9 billion the end of the first half of 2015, of which UAH 7.1 billion were VAT refund arrears, equivalent to 1.1 and 0.4 percent of GDP respectively (IMF, 2016).

Have politically connected firms received unfair advantage in the VAT refund process when compared with their non-connected peers? We compare politically-connected and non-connected firms' access to refunds and the timeliness with which refunds are issued. The analysis is based on the data set of connected firms and data from the Ministry of Finance and the State Fiscal Service (SFS) on audits, refund claims, SFS decisions and the payments of the VAT refund for the period February 2016 through March 2017. Most of the unplanned audits in Ukraine relate to desk audit, which takes up to 30 days, and document inspection, which takes up to additional 30 days, before the decision on refund is made.

Compliance costs for politically-connected firms are lower than those for non-connected firms. A connected firm is 61 percent less likely to be audited than a non-connected firm controlling for turnover and other factors (Annex 3 provides details of the estimate). Firms with higher turnover overall are more likely to be audited. This is to be expected given the higher revenue potential. A number of other factors – sector, age of company, number of employees - seem to be important determinants on the likelihood of audit. There is a negative correlation between the firm being connected and likelihood of the firm being audited related to a VAT refund.

Recent reform efforts have made some progress in addressing the fairness and efficiency of the refund process. From the second half of 2015, outstanding VAT claims have been on a downward trend as a result of the government's effort to increase automatic VAT refunds. The analysis of the largest 20 exporting companies shows that in 2014, 10 out of 20 companies in the list were connected companies and they received 63 percent of total refunds of the 20 largest exporters. In 2016 10 out of 20 of the largest exporters were still connected, but their share in VAT refunds decreased to 43 percent. Nonetheless, politically-connected firms continued to benefit from a lower likelihood of VAT refund-related audits, which in most cases provides for faster refund processing. In April 2017, a single VAT refund registry was introduced to ensure automatic VAT refunds for all companies.

#### AIR TRANSPORTATION - EXPLOITING MONOPOLISTIC STATUS TO EXTRACT BENEFITS

The Ukrainian air transportation market is dominated by a single large player: Ukrainian International Airlines (UIA). In the beginning of 2013 one of the two largest Ukrainian airlines – Aerosvit,<sup>4</sup> part of Privat group – entered bankruptcy and stopped all flights. Media reports speculated that the bankruptcy was artificial since a large part of outstanding debt was to companies affiliated with Privat group.<sup>5</sup> As a result of the bankruptcy, UIA became the only large operator on intra-Ukrainian routes. UIA carries over 80 percent of domestic passengers as the only airline on most domestic routes. It also services many international destinations. In the largest Ukrainian airport, Boryspil, UIA has a market share of around 60 percent. UIA has benefitted from several decisions by public entities that have helped strengthen and protect its monopolistic position by creating barriers for other carriers to enter the market.

In 2013, UIA secured preferential prices for passenger transfers, aircraft service, and parking space from the Boryspil Airport. UIA received discounts in the range of 50-80 percent on services

<sup>4</sup> [http://www.magazine-rest.in.ua/ua/articles/from\\_ukrainian\\_aviation\\_market\\_takes\\_one\\_of\\_the\\_two\\_most\\_powerful\\_players.html](http://www.magazine-rest.in.ua/ua/articles/from_ukrainian_aviation_market_takes_one_of_the_two_most_powerful_players.html)

<sup>5</sup> <http://www.theinsider.ua/rus/business/53c93648d5a12/>

of Boryspil Airport through an amended contract.<sup>6</sup> The amendments also included preferred parking space for aircraft and prime real estate in the airport terminal. Discounts were introduced until 2019 and dispute settlement was set in Zurich arbitration court under Swiss Chamber Arbitration Institution's rules.

UIA managed to obtain privileged access to new international routes in 2014. In 2014 Ukrainian State Aviation Service (SAS) headed by a long-time UIA employee<sup>7</sup> issued new regulations<sup>8</sup> allowing only airlines that flew domestic routes to apply for new international route assignments and tied the number of international flights to the number of domestic flights (with 15:1 ratio for popular routes and 30:1 ratio for routes with traffic of under 100,000 passengers per year). UIA's competitors and some industry experts claimed that these regulations favored UIA as the dominant domestic flights operator because any new market entrant would have to invest substantially in domestic routes to meet the requirements. The SAS justified the regulations by the need to develop domestic air service.<sup>9</sup> In 2015, the Head of SAS was suspended, and later dismissed.<sup>10</sup> In 2016, a new head of SAS was appointed. SAS subsequently amended its regulations<sup>11</sup> to remove the domestic flight requirements for international route assignments.

A recent Anti-Monopoly Committee report points out the weaknesses in the air transportation market and lays out a roadmap to address them. The Anti-Monopoly Committee's (AMC) 2016 annual report<sup>12</sup> revealed several concerns related to the passenger air transportation market. First, airlines already authorized to fly routes consistent with international agreements may underutilize allowed capacity or suspend flights for up to 12 months. Competitors may not use unutilized capacity. This favors established airlines, including UIA. A review of court cases shows that UIA successfully argued that it could ask SAS to increase the frequency of flights on existing route assignments using a simplified procedure, not available to other carriers.<sup>13</sup> Following the 2016 change in leadership, SAS now is working on a new version of regulations that will remove these loopholes. In June 2016, the AMC issued recommendations to the Boryspil Airport and the Ministry of Transport,<sup>14</sup> which pointed out that UIA still received preferential rates from Boryspil while other companies' requests for discounted airport services were refused. AMC warned Boryspil that this may violate competition legislation and asked Boryspil and the Ministry to develop clear criteria for the application of discounts. In February 2017 and subsequently in May 2017 Boryspil offered similar discounts to other carriers.<sup>15</sup>

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<sup>6</sup> Events and contract modification as explained in related Kyiv commercial court ruling found at <http://reyestr.court.gov.ua/Review/32737266>

<sup>7</sup> See UIA press release referring to long career of Antoniuk in UIA <https://www.flyuia.com/ua/about/ukraine-international-airlines/customer-relations/news/News.html?news=2463&category=3>

<sup>8</sup> <http://zakon3.rada.gov.ua/laws/show/z1440-14/ed20141024> (as approved)

<sup>9</sup> <http://biz.liga.net/all/transport/stati/2873476-liberaly-vs-protektivisty-kto-vazhnee-passazhir-ili-mau.htm>

<sup>10</sup> Litigation about unfair dismissal is still pending. Lower courts sided with the government, but a new trial was ordered in cassation. Cassation seems to be based on procedural issues rather than dispute of facts justifying. See <http://reyestr.court.gov.ua/Review/66002469> (decision of High Administrative Court ordering new trial).

<sup>11</sup> <http://zakon3.rada.gov.ua/laws/show/z0636-16> (amendments)

<sup>12</sup> [www.amc.gov.ua/amku/doccatalog/document?id=133712](http://www.amc.gov.ua/amku/doccatalog/document?id=133712)

<sup>13</sup> <http://reyestr.court.gov.ua/Review/65170010>

<sup>14</sup> Recommendations of AMC are not binding but mandatory for consideration and their adoption may be grounds for closing competition case without penalty.

<sup>15</sup> [https://kbp.kiev.ua/i/file/polozhennya\\_koef\\_2017\\_05.pdf](https://kbp.kiev.ua/i/file/polozhennya_koef_2017_05.pdf)

## QUANTIFYING ECONOMIC IMPACTS

The economic performance of politically-connected firms in Ukraine is significantly different from that of their non-connected peers. Econometric analysis, covering Ukraine's firm-level data for 2006-2015, and using both approaches for the identification of politically-connected firms, found statistically significant differences in their economic outcomes compared to the other firms controlling for sector, size and age of firms.<sup>16</sup> Annex 3 details these estimations. It is important to note that results presented here are only descriptive and identify correlations, but do not prove causality. The results for politically-connected firms identified using the second approach (ownership and influence) show stronger performance differentials between politically-connected and non-connected firms, than firms identified using the first approach (ownership). However, both results are statistically robust.

Politically-connected firms are larger than their non-connected peers. Politically-connected firms have higher turnover and employ more labor than non-connected firms. Politically-connected firms identified using Approach 1 have 8.9 percent higher turnover and employ 11.1 percent more labor than non-connected firms.<sup>17</sup> The gap is even larger for politically-connected firms identified using Approach 2, with 28.8 percent higher turnover and 23.2 percent more labor.

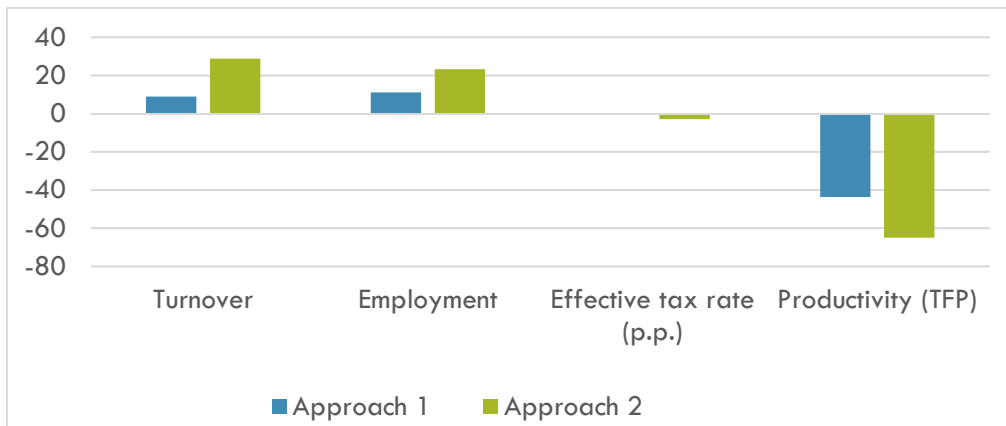
Politically-connected firms pay a lower effective tax rate. Politically-connected firms identified using Approach 1 have a 0.4 percentage point lower effective tax rate, those identified using Approach 2 have a 2.9 percentage points lower tax rate.

Politically-connected firms are less productive. Politically-connected firms have a negative Total Factor Productivity (TFP) gap compared to non-connected firms. The gap ranges from negative 43.7 percent for firms identified using Approach 1 to negative 65 percent for firms identified using Approach 2. In addition, the analysis shows that TFP is likely to be lower in companies with a higher market share and in more concentrated industries. This indicates that there could be a potentially large pay-off from policies that promote competition.

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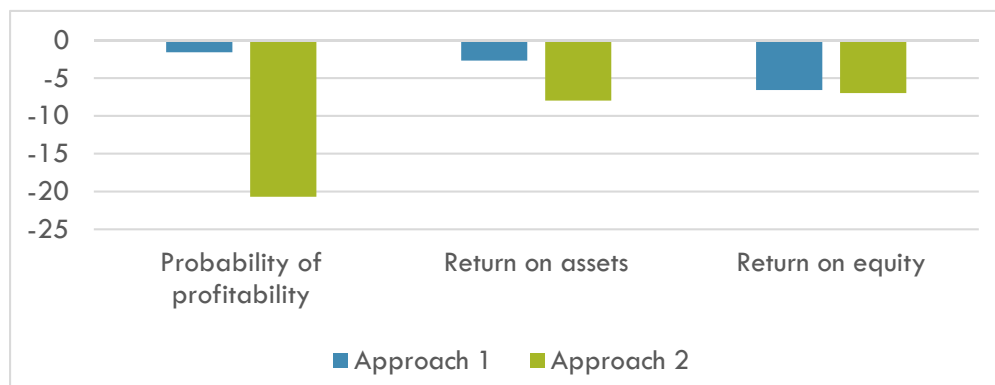
<sup>16</sup> RUSLANA data set covering the period of 2006-2015 gives around 2 million observations. Random effects estimation has been selected, since the dummy variable for the connected companies implies no variation in it. There are single observations on both owners and PEPs, so a firm is assumed to be connected for the whole analyzed period (in other words, a firm does not change its status from non-connected to connected and vice versa during the period 2006-2015).

**Figure 5. Politically Connected vs Non-Connected Firms  
(percent, relative to non-connected firms)**



Politically-connected firms are also less profitable. Firms identified using Approach 1 have 1.6 percentage points lower probability of being profitable than non-connected firms. Firms identified using Approach 2 have 20.7 percentage points lower probability of being profitable.<sup>18</sup> Not surprisingly, politically-connected firms tend to have lower return on assets and equity. Return on assets is lower by 2.7 to 8 percentage points, while return on equity is lower by 6.6 to 7 percentage points. The potential reasons for lower profitability could be aggressive tax planning and shifting of the profits to other jurisdictions. Recent work of Balabushko, Beer, Loeprick and Vallada finds direct revenue losses linked to treaty restrictions on taxing rights, especially for flows into a few major investment hubs.

**Figure 6. Connected firms are less profitable (percentage points, relative to non-connected firms)**

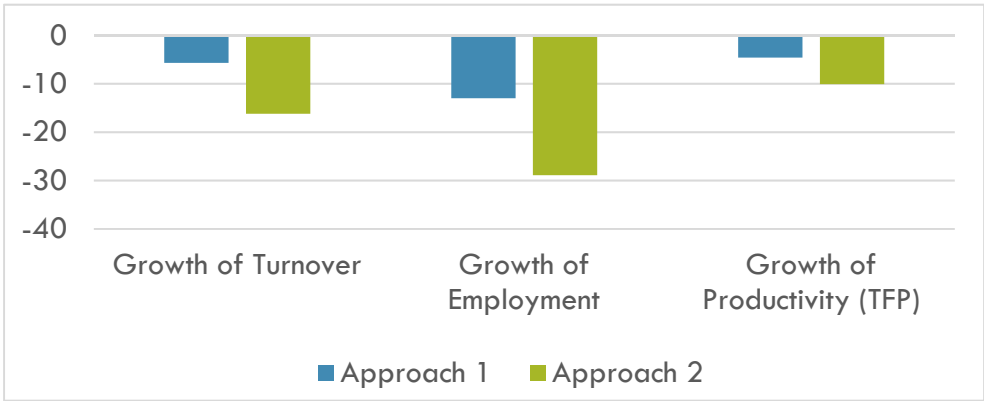


<sup>17</sup> Numbers in the write-up could differ from the regression coefficients due to coefficient interpretation issues. For example, given case is log-lin, so interpretation is the following:  $\exp(0.085)=1.089$ .

<sup>18</sup> Probability of connected:  $\log(0.29-0.065)/(1 + \log(0.29-0.065))=55.6$  percent. Probability of non-connected is  $\log(0.29)/(1 + \log(0.29))=57.2$  percent. The difference is 1.6 percentage points.

Politically-connected firms grow slower than non-connected firms. Not only are politically-connected firms less productive, they also tend to have slower growth of turnover, labor and productivity (TFP). The growth difference range for turnover is -5.7 to -16.2 percentage points, for employment -13.0 to -28.9 percentage points, and for productivity (TFP) it is -4.6 to -10.1 percentage points (with the larger differences in each case for firms identified using Approach 2). A possible explanation behind significantly lower economic performance of the firms under Approach 2 is a high share of large politically connected firms frequently associated with oligarchic groups under this approach. Such firms tend to have better access to rents and less incentives to compete.

**Figure 7. Connected firms grow more slowly (percentage points, relative to non-connected firms)**



## CONCLUSIONS

Firm-level data analysis reveals that the share of politically-connected firms in the Ukrainian economy is unusually high, ranging between 15 and 20 percent of employment and turnover. Two approaches were used to identify politically-connected firms: one identifying firms solely on the basis of formal owners, managers and ultimate beneficiaries being politically-exposed persons; the second approach uses data from investigative journalism to identify links between the owners of business groups and officials in key state institutions. The economic weight of politically-connected firms is similar using both approaches and the firm-level analysis shows robust results for both approaches to the identification of politically-connected firms.

The politically-connected firms reap the benefits from preferential treatment when interacting with the state and limiting market competition. A case study of the administration of VAT refunds shows that politically-connected firms were 61 percent less likely to be audited when requesting a VAT refund during February 2016 - March 2017, thus enjoying lower costs for paying taxes than other firms. The case of air transportation shows how regulations restricting competition and granting preferential access to benefits have helped firms secure and maintain market dominance.

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## ANNEX 2. ALGORITHMS TO DEFINE POLITICALLY CONNECTED BUSINESSES UNDER THE FIRST AND SECOND APPROACHES

### FIRST APPROACH

1. Apply last name and first name criteria to check whether the global owners are PEPs.
2. Apply last name and first name criteria to check whether the local owners are PEPs.
3. Apply last name and first name criteria to check whether the shareholders are PEPs.
4. Apply last name and first name criteria to check whether all the directors and managers are PEPs.
5. Applying full name criteria to check whether the global legal owners are PEPs.
6. Applying full name criteria to check whether the local legal owners are PEPs.
7. Applying full name criteria to check whether the shareholders are PEPs.
8. Check all the firms' full names for being directly included into PEPs.
9. Clean the database by removing people with the same name including by checking middle name and eliminating foreign PEPs.

### SECOND APPROACH

1. Identify business groups, their owners, firms within these business groups, as well as years of entering and exit to/from business group based on existing publications.
2. Identify connection between politicians and business owners based on investigative journalism.
3. Companies owned by people detected in step (2) are defined as connected.
4. Identify business groups, which finance parliament fractions.
5. Companies which belong to business groups responsible for financing of parliament fractions are defined as connected.
6. Companies owned by MPs from the parliament fractions financed by business groups are defined as connected.
7. Analyze the information on political connections of business owners available in the media (e.g. <http://politrada.com/dossier/> ) and assign additionally detected companies with a status of connected.
8. Merge all the lists of firms defined as connected in steps (2), (5), (6) and (7), double-check their owners and history of ownership (i.e. acquisition/loss of a "connected status").



## ANNEX 3. REGRESSION ANALYSIS

### Firm level regressions

	(Aprr 1)	(Aprr 2)	(Aprr 1)	(Aprr 2)	(Aprr 1)	(Aprr 2)
	Log	Log	Log	Log	Log	Log
	Turnover	Turnover	Labor	Labor	TFP	TFP
Connected	0.085***	0.253***	0.105***	0.209***	-0.574***	-1.050***
(1 if yes)	(0.010)	(0.023)	(0.004)	(0.009)	(0.008)	(0.017)
Log Turnover			0.148***	0.148***	0.630***	0.630***
			(0.000)	(0.000)	(0.000)	(0.000)
Lag Log Turnover	0.520***	0.520***				
	(0.001)	(0.001)				
Log Labor	0.642***	0.642***				
	(0.001)	(0.001)				
Lag Log Labor			0.706***	0.706***		
			(0.000)	(0.000)		
Lag Log TFP					0.103***	0.103***
					(0.000)	(0.000)
Age	-0.037***	-0.037***	0.003***	0.003***	-0.029***	-0.028***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age^2	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Share of turnover in industry, %	1.817***	1.797***	0.211***	0.195***	-0.497***	-0.468***
	(0.063)	(0.063)	(0.027)	(0.027)	(0.037)	(0.037)
Herfindahl-Hirschman Index	0.003***	0.003***	0.005***	0.005***	-0.017***	-0.017***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Intercept	1.651***	1.655***	-0.464***	-0.460***	0.146***	0.123***
	(0.007)	(0.007)	(0.003)	(0.003)	(0.006)	(0.006)
Year effects	YES	YES	YES	YES	YES	YES
Industry effects	YES	YES	YES	YES	YES	YES
N	1880482	1880482	1880482	1880482	1528237	1528237
R2	0.785	0.785	0.884	0.884	0.713	0.713

Standard errors in parentheses

\*  $p < 0.05$  \*\*  $p < 0.01$  \*\*\*  $p < 0.001$

Firm-level regressions (cont.)

	(Apr 1)	(Apr 2)	(Apr 1)	(Apr 2)	(Apr 1)	(Apr 2)	(Apr 1)	(Apr 2)
	Profitable	Profitable	Tax	Tax	ROA	ROA	ROE	ROE
	(1 if yes)	(1 if yes)	Effective	Effective				
Connected	-0.065***	-0.845***	-0.409**	-2.914***	-2.677***	-7.965***	-7.054***	-6.561***
(1 if yes)	(0.011)	(0.029)	(0.137)	(0.358)	(0.192)	(0.456)	(0.496)	(1.190)
Log Turnover	0.084***	0.087***	1.530***	1.533***	2.058***	2.060***	4.354***	4.342***
	(0.001)	(0.001)	(0.008)	(0.008)	(0.009)	(0.009)	(0.023)	(0.023)
Log TFP	0.329***	0.326***						
	(0.002)	(0.002)						
Age	0.018***	0.019***	-0.022***	-0.022***	-0.092***	-0.089***	-2.385***	-2.385***
	(0.000)	(0.000)	(0.004)	(0.004)	(0.005)	(0.005)	(0.012)	(0.012)
Age <sup>2</sup>	-0.000***	-0.000***	0.000*	0.000**	0.000	0.000	0.012***	0.012***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Share of turnover in industry, %	-1.672**	-1.043	-3.351***	-3.105***	-9.315***	-8.678***	-6.832*	-7.026*
	(0.592)	(0.681)	(0.805)	(0.806)	(1.292)	(1.293)	(3.330)	(3.333)
Herfindahl-Hirschman Index	-0.015***	-0.015***	0.033***	0.033***	-0.185***	-0.184***	-0.475***	-0.475***
	(0.000)	(0.000)	(0.002)	(0.002)	(0.003)	(0.003)	(0.007)	(0.007)
Intercept	0.290***	0.279***	-7.125***	-7.163***	11.201***	11.081***	54.275***	54.137***
	(0.013)	(0.013)	(0.123)	(0.123)	(0.149)	(0.149)	(0.382)	(0.382)
Year effects	YES	YES	YES	YES	YES	YES	YES	YES
Industry effects	YES	YES	YES	YES	YES	YES	YES	YES
N	1904638	1904638	1169242	1169242	2081800	2081800	2062581	2062581
R2	0.087	0.087	0.191	0.192	0.051	0.051	0.055	0.055

Standard errors in parentheses

\*  $p < 0.05$  \*\*  $p < 0.01$  \*\*\*  $p < 0.001$

Firm-level regressions (cont.)

	(Apr 1)	(Apr 2)	(Apr 1)	(Apr 2)	(Apr 1)	(Apr 2)
	Growth	Growth	Growth	Growth	Growth	Growth
	Turnover	Turnover	Labor	Labor	TFP	TFP
Connected (1 if yes)	-5.666*** (0.466)	-16.246*** (1.133)	-13.020*** (2.571)	-28.481*** (6.215)	-4.612*** (0.450)	-10.116*** (1.055)
Log Turnover	5.770*** (0.030)	5.779*** (0.030)			3.081*** (0.031)	3.082*** (0.031)
Log Labor			18.507*** (0.265)	18.494*** (0.265)		
Log TFP						
Lag Growth Turnover	0.000 (0.000)	0.000 (0.000)				
Lag Growth Labor			-0.031*** (0.001)	-0.031*** (0.001)		
Growth Labor	0.039*** (0.000)	0.039*** (0.000)				
Lag Growth TFP					-0.000*** (0.000)	-0.000*** (0.000)
Age	-0.489*** (0.013)	-0.480*** (0.013)	-1.895*** (0.074)	-1.881*** (0.074)	-0.079*** (0.013)	-0.073*** (0.013)
Age^2	0.001*** (0.000)	0.001*** (0.000)	0.006*** (0.001)	0.006*** (0.001)	-0.000 (0.000)	-0.000 (0.000)
Share of turnover in industry, %	-21.330*** (3.388)	-19.636*** (3.393)	-38.531* (19.447)	-35.953 (19.474)	-14.056*** (3.194)	-13.241*** (3.198)
Herfindahl-Hirschman Index	-0.022*** (0.004)	-0.021*** (0.004)	-0.296*** (0.024)	-0.295*** (0.024)	-0.043*** (0.005)	-0.042*** (0.005)
Intercept	-10.083*** (0.379)	-10.421*** (0.380)	9.179*** (2.006)	8.582*** (2.007)	4.969*** (0.411)	4.704*** (0.412)
Year effects	YES	YES	YES	YES	YES	YES
Industry effects	YES	YES	YES	YES	YES	YES
N	1366038	1366038	1492182	1492182	1106080	1106080
R2	0.052	0.052	0.002	0.002	0.028	0.028

Standard errors in parentheses

\*  $p < 0.05$  \*\*  $p < 0.01$  \*\*\*  $p < 0.001$

Logit Regression on Probability of Audit for VAT Refund

Parameter	Coefficient	z (p-value)
conn_firm	-0.48	-3.5 (0.000)
log-turnover	0.15	10.58 (0.000)
_cons	-1.08	-9.52(0.000)