KYIV SCHOOL OF ECONOMICS

MASTER'S PROGRAM IN PUBLIC POLICY AND GOVERNANCE

THESIS

«Effect of Euromaidan in 2013-2014 on the role of political connections in the enrichment of Ukrainian economic elites»

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ANNOTATION

This study examines the role of Euromaidan on the enrichment of politically connected economic elites in Ukraine. Even though politically connected elites use political preferential treatment and benefits to increase their wealth in Ukraine, the role of political turnovers in this process is not identified. Based on the ratings of the top-100 richest people of Ukraine of journal "Focus" and data on the economic performance of their firms in 2010-2018, we have identified the impact of Euromaidan on the performance of politically connected economic elites. The role of political connections on assets of top-100 decreased during the revolution, but remained positive and increased in the post-revolutionary period. The data on firm performance showed that during the post-Euromaidan period between 2015-2018 the role of political connections on revenues, gross profit, and EBIT of firms increased.

Keywords: political turnover, Euromaidan, economic elites, state capture, crony capitalism.

Numbers of words: 10851

INTRODUCTION

Ukraine is a weak democracy characterized by a strong influence of economic and financial groups on the political system, so-called crony capitalism, since the late 1990s. The consensual view is that state capture conducted by the politically connected economic elites ("oligarchs") has a strong negative effect on the long-term social and economic development of Ukraine. On the other hand, Ukraine is a country with political competition, free elections, and frequent changes of the leading political party, which also changes political decision-makers.

The analytical problem is that even though after Euromaidan in 2013-2014 crony capitalism remained important in shaping the Ukrainian political system, large proportion of politically connected economic elites as a result of revolution lost their connections established during the presidency of Viktor Yanukovych.

In this study, we examine whether Euromaidan in 2013-2014 affected the enrichment of politically connected economic elites and the economic performance of their firms. This study is important to understand the role of political cycles in the ability of policy-makers to decrease the scale of crony capitalism, or "oligarchisation", in Ukraine.

The hypothesis of the study is that Euromaidan in 2013-2014 decreased the effect of political connections on the enrichment of economic elites, but this effect evaded in the post-revolutionary period in 2015-2018. The explanation is that Euromaidan, as a political turnover, broke previously established political connections during the presidency of Yanukovych. However, as new political parties took power in Ukraine, the politically connected economic elites, through indirect political influence, like corruption, financing political parties, media influence, re-established political connections in the post-revolutionary period.

For analysis, we will use the data from ratings of top-100 richest people of Ukraine of journal Focus and balance sheet level data of firms of top-100 richest people of Ukraine in 2010-2018. To test the hypothesis, we will use the difference-in-difference method in two stages. Firstly, we will compare the significance of political connection for the change of assets of 100 richest Ukrainians in 2010-2018, covering four years before Euromaidan and four years after Euromaidan. Secondly, we will identify the firms of the top-100 richest Ukrainians for the selected period and compare the effect of Euromaidan on revenues, profits, and other economic performance indicators of firms of politically connected owners or beneficiaries. For the models, we will also compare these effects in the revolutionary (2013-2014) and post-revolutionary periods (2015-2018).

LITERATURE OVERVIEW

The role of political connection in the enrichment of economic elites

Political turnover impacts the interaction of political and economic actors in political regimes because it usually changes the decision-makers in legislative and executive branches of power that have their policy agenda. The effect of political turnover on the enrichment as an increase in assets, revenues, and profits of politically connected actors in academic literature and remains discussed.

The first large question in academic discussion is how political connections affect economic performance and enrichment of economic elites among different countries. The conventional view is that an extractive regime where a narrow group exploits the political system provides enormous opportunities for enrichment for one narrow circle of economic elites and prevents others from economic opportunities (Acemoglu & Robinson, 2012). This system is also called crony capitalism, the situation when economic actors in the market exploit their political connections to get more preferences, and consequently profits and assets. Crony capitalism is to a larger extent more typical problem for weak democracies with low institutional capacities and autocratic regimes (World Bank Group, 2018). When the political system creates preferences and privileges for politically connected actors and barriers for politically nonconnected businesses, the market competition is damaged, nonconnected businesses have disincentives to produce and sell more. Eventually, it leads to the economic underdevelopment of the states.

Faccio (2010), in a cross-country analysis of politically connected firms among 47 countries, shows that connected firms financially underperform in comparison with non-connected firms. Particularly, she shows that politically connected firms possess a higher leverage rate (rate of long-term borrowings), a lower tax expense rate, and larger market power. She also shows lower returns on assets and market valuation for politically connected firms. Notable, that the effect on productivity did not show statistical significance, but the model applied for Russian firms showed statistically significant lower productivity for politically connected firms. Cross-country comparison also illustrates that the higher political links and a higher level of corruption increase marginal differences between politically connected and non-connected firms.

Another study confirms the finding of low productivity rates of politically influential firms (Desai, Raj & Olofsgård, Anders, 2011). However, this study of 8000 firms reports higher employment levels and tax revenues, which explains at least some level of political compensation that political elites may gain for preferential treatment. This can be explained by the persistency of crony capitalism in the world despite the

negative effect on the economic development of the country. However, the factor of political corruption and rent-seeking behavior of political decision-makers remains the key reason for preferential treatment.

The study of the economic performance of politically connected large businesses in post-Soviet countries that exploited their connections to gain assets through privatization of state-owned enterprises in 1990-the 2000s shows mixed results. The study of the role of oligarchs in Russian Capitalism (Guriev, 2005) illustrates that as for the data to 2005, the oligarchs run firms more efficiently than other firm owners in Russia. It correlates with the idea that during the first years after privatization, large businessmen-oligarchs indeed had a positive impact on their performance and productivity and had more resources to invest in their firms. However, with the increase of extractive behavior, their overall effect on economic performance as well as on market economy turned negative, that the most recent study on crony capitalism in Ukraine conducted by the World Bank confirms (World Bank Group, 2018).

The studies for Ukraine confirm similar results. The effect of privatization by mostly politically connected businessmen of state-owned assets in the 1990s-2000s on the performance of the firm in Ukraine show a positive effect on multifactor productivity (Brown, J. & Earle, John S & Shpak, Solomiya & Vakhitov, Volodymyr, 2018). Therefore, initially, privatization of firms overall had a positive effect on their economic performance despite its not transparent procedure of major privatization. But since the 2000s an important comparison lies not only between the economic performance of state-owned and privatized enterprises but also between politically connected and non-connected private firms.

The recent study of the World Bank "Crony capitalism in Ukraine: impact on economic outcomes" analyzes the economic performance of politically connected firms for 2006-2015. Based on the study, politically connected firms share between 15% to 20% of total turnover and employment in the Ukrainian economy, which an increase in percentage during the presidency of Viktor Yanukovych in 2009-2014. The study illustrates that politically connected firms are more likely to benefit from political preferences. The study also reveals that politically connected firms are larger in their assets and number of employed.

The productivity indicators are lower for politically connected firms in comparison with politically not connected, they show slower growth rates and pay fewer taxes. The researchers estimate that if the productivity level of politically connected firms would be the same as for the politically not connected firms, the Ukrainian economy would grow 1-2% faster from the current level (World Bank Group, 2018).

This study reveals statistically significant differences between the economic performance of politically connected and non-connected firms but does not analyze the effect of political turnover on this process.

The role of political turnover on politically connected economic elites

Based on theories of democratization, the political turnover creates the window of opportunities to increase the possibility of political participation in social groups and build political institutions to prevent state capture (Acemoglu & Robinson, 2012). State capture is viewed as control of narrow economic groups over political decisions. The key political decisions include the economic and trade preferences, control over the redistribution of the state budget, control over the legal system (Hellman and Kaufmann, 2001).

The countries with a high propensity of government to collapse illustrate lower GDP growth rates than politically stable states. Such political instability negatively affects both politically connected and non-connected firms. Usually, it is caused by macroeconomic instability and negative investment disincentives that decline the economic growth of the country.

In strong democratic states with high state capacity and political pluralism, the peaceful power transition guarantees competitiveness in both political and economic systems. In general, it promotes inclusive social systems ensuring sustainable economic and social development (Cingolani, 2018). In the case of weak democratic institutions, however, the effect of political turnover, either as a revolution or peaceful transition, is not clear.

In highly corrupt and captured weak democracies, economic elites have complete control over the political system, and political competition is the competition among the economic groups for power. In the case of political victory, the economic groups affiliated with the party would get economic preferences and benefits that would increase their assets and improve their firms' profitability compared to economic groups affiliated with other political parties (Hellman, 2000).

For Ukraine, the consensus is that impact of political connections on the economic performance of firms is considered large and party-based, meaning that political changes affect the large businesses-supporters and opponents of the political party taking power. For example, the study on the effect of the Orange Revolution in 2004 in Ukraine on economic performance in regions that supported elected president Yushchenko in Western Ukraine, and, on the other hand, regions that supported his opponent Yanukovych in Eastern Ukraine, revealed the difference between two groups (Earle & Gehlbach, 2015). The authors conclude that firms located in pro-Yushchenko regions were experiencing higher economic productivity growth in 2004-2008 than

firms in pro-Yanukovych regions in Eastern Ukraine, which was assumed to correlate with larger economic preference and governmental support granted that shifted from Eastern to Western Ukraine. Based on this study, we can also state that not only political connections in general but also belonging to the leading political party, is also reported to have a particular effect on the enrichment of economic elites after a political turnover in Ukraine.

Another concept developed for the transition democracies is that politically connected economic elites, after being formed, prefer using indirect instruments of control over the political system instead of direct. This makes them "resistant" to political turnovers. Oligarchs prefer flexibility over commitment to one political party. They prefer controlling media and financing different political groups to diversify their risks in case of political turnover and then re-establish their political connections after a new government is elected (Markus & Charnysh, 2017).

The authors claim that oligarchs who financed political parties and held media assets had higher wealth increase than oligarchs directly participating in politics between 2006 and 2012. This study argues that democratization is not a threat for Ukrainian oligarchs because they control the political party system through financial support, controlling key media sources, and the ability to "jumpstart" new political projects. This concept is important for our study because for politically connected elites, who exploit indirect methods of political influence, the political turnover is likely to be less harmful, and they will reinstate their political connections with the new government and leading political party.

The understanding of political turnovers in Ukraine affects political connections is important in understanding the role of timing and political cycles in the implementation of an anti-oligarchic and anti-corruption policy agenda. This is also related to the empirical term of "window of opportunities" that is identified as the period after a new political group gets power in the country when there is a high chance of success in the implementation of reforming policies. If the political turnover negatively affects the influence of political connections on the enrichment of economic elites, but they re-establish with time, then it can be a significant factor for identifying why "window of opportunities" as the period after turnover is considered the best time for policy implementation.

Research question and hypothesis

The research question of the study is how Euromaidan as a political turnover in 2013-2014 changed the role of political connections in the enrichment of economic elites of Ukraine?

The hypothesis of the study is that Euromaidan decreased the effect of political connections on the enrichment of economic elites, but this effect evaded in the post-revolutionary period between 2015 and 2018.

RESEARCH DESIGN

The general population for the study is the wealth of economic elites in Ukraine. We identify economic elites as "the set of individuals who own the factors of production in an economic extraction, processing, utilization, and/or trading of specific resources, goods, and their derivatives" (Frieden, 2016). The indicators for wealth are the overall estimated assets of the person, revenues, and profits of his or her firms, whether he is owner or beneficiary.

We operationalize the term of economic elites as the people with the largest assets in Ukraine and who own the largest share of factors of production. The list of the businessmen with the largest assets in Ukrainian sectors of the economy is presented in the ratings of the 100 richest people of Ukraine. These people have the largest amount of financial resources in Ukraine and hold the largest economic power as individuals. Therefore, we identify this list as our general population.

We choose the ratings of the 100 richest people of Ukraine in 2010-2018 to form a sample for our study, with assets of both politically connected and non-connected people. The list of the 100 richest people of Ukraine has been published regularly between 2010 to 2018. This will enable us to form the time-series panel data based on the resource chosen.

The basis of our sample is people from top-100 in 2010 and those who were included in the list in 2011-2018 (new in top-100). There are three different ratings of top-100 of Forbes Ukraine, Focus, and Novoe Vremia (with Dragon Capital). All three journals have different methodologies, and for this study, we choose the ratings of Focus. Focus has all the ratings publicly available for 2010-2018 and did not report changing the methodology of estimations, which is essential for our estimations to ensure consistency.

The limitation of the study is that the evaluation of assets of top-100 richest Ukrainians estimate potentially underestimates real assets of top-100 as many of the assets of large Ukrainian businessmen are registered in offshore zones and are not directly related to businessmen.

We choose three samples for our study: first is the assets of 43 people, who have been permanently present in the ranking of top-100 during 2010-2018; second is the list of 100 people in the ranking in 2012; third is the balance sheet indicators of Ukrainian firms of people that were in the ranking of top-100 in 2010-2018 for 2011-2018 fiscal years. For the third sample, we have collected the indicators for those firms, that were identified using open public sources. Each of the samples was used to build linear models for regression analysis, more details are provided in the methodology.

Methodology

To identify the influence of Euromaidan on the effect of political connections on the wealth of Ukrainian economic elites, we apply the difference-in-difference model.

We choose two approaches to identify the influence. For the first approach, we measure the effect of Euromaidan (2013-2014) and post-Euromaidan period (2015-2018) on assets of politically connected people that were present in the top-100 list during all the period of 2010-2018. For this study, we take the year of the beginning of Maidan in 20130 as the beginning of shock. Not all people were permanently represented in the list of top-100 richest people of Ukraine, and therefore, after data is formed, this sample size will consist of 43 businessmen, so we can evaluate their change of assets between 2010 and 2018. For sample size 2, we will use the data about people from top-100 ranking in 2012 to identify the likelihood for them to drop depending on the political connections in Euromaidan and post-Euromaidan period.

For the second approach, we measure the effect of Euromaidan and post-Euromaidan period on assets, revenues, and profits of firms of politically connected people that were present at least once in the top-100 list in 2010-2018 based on the data about firms of 138 members of the list during this period.

For the models in this study, we use numeric, categorical, and dummy variables. Our independent variable is political connections (x) that are predicted to affect the (y) - the assets of 43 businessmen that permanently were present in the list of top-100 richest people of Ukraine (Approach 1) and the profits and revenues of the firms of people that were present at least once in the top-100 list in 2011-2018 (Approach 2). For approach 2 we have found firms of 138 people out of 176 present in the ratings of Focus. Because our second approach includes only firm data for 2011-2018 years reported in 2012-2019, for Approach 1 we will use the data for both 2010-2018 and 2011-2018 to ensure consistency of the study.

Euromaidan in 2013-2014 is a political shock (z) that is predicted to change the interaction between political connections and assets of a person, revenues and profits of his or her firm.

We use descriptive statistics to make the general analysis, particularly the analysis of the number of politically connected people from top-100, its change before and after the revolution, the relationship between political connections and asset size, the overall change in assets of top-100 richest people of Ukraine during and after Euromaidan.

Afterward, we apply the regression analysis using R, to identify the statistical significance and magnitude of the effect of the political connections, industry, region on the asset size of the person based on Approach 1. Interaction variables in the model

measure the impact of shock, Euromaidan (2013-2014) and post-Euromaidan period (2015-2018), on the influence of political connections on wealth.

The difference-in-difference model (linear model) at the second stage is presented in Equation 1:

$$y_{jt} = p_j + p_j * h_t + t_j + r_j + z_j + \varepsilon_{jt} \quad (1)$$

Y is the asset size of the person from the TOP-100 list in the observed year (2010-2018) (approach 1). P is variable for politician connection (0,1) or (-1;0;1), h is the political shock as a dummy variable for all the period during and after Euromaidan (2013-2018), z is the region of the person, r is the key industry of the person, j identifies the person and t the year of observation.

We will also divide the first interaction variable into two interaction variables for the Euromaidan period (2013-2014) and post-Euromaidan period (2015-2018) to see whether this effect was different in the post-revolutionary period, specified in Equation 2. K is the dummy for the Euromaidan period (2013-2014) and post-Euromaidan period (2015-2018).

$$y_{jt} = p_j + p_j * k_t + p_j * l_t + t_j + r_j + z_j + \varepsilon_{jt} \quad (2)$$

We will also use 2 different interaction variables for Yanukovych supporters and Yanukovych opponents to identify the party-based effect of Euromaidan on economic effects.

Additionally, we will also apply the logistic regression model to identify the risk of dropping from the list of top-100 after Euromaidan for politically connected people for 100 people that were presented in the list of top-100 richest people of Ukraine in 2012. The equation for the model is presented in Equation 4. D is a dummy variable for whether the person dropped from the list of top-100 after Euromaidan (2013-2018) or during Euromaidan (2013-2014), p is the political connection of the person. The model takes into account the asset size of the person in 2012 (A) and the base region of person (z).

$$D_{jt} = p_j + z_j + A_{jt} + \varepsilon_{jt} \quad (3)$$

During the second stage of analysis for analysis of Sample 3, we will apply the linear model used for assets taken from the list of top-100 richest people of Ukraine to revenue, profit, assets, and other economic performance indicators of the firms reported for 2012-2019. The reports include the information about firm performance in the previous fiscal year, so these indicators cover 2011-2018.

The list of independent variables would not change, so the equation will be as illustrated in Equation 1 and Equation 2, but we would use the following economic performance variables as dependent variables (y) representing the wealth growth of owners or beneficiaries of the firms of top-100 – revenues, gross profits, assets, EBIT (earnings before interest and tax), EBIT margin, quick ratio, and net debt ratio. We use the assets in line with the dependent variable in approach 1; the revenues show how much product or service was sold to customers. The revenue indicators are important because they are more volatile than assets, and political preferences can affect revenue by providing economic or oligopolistic preferences or receiving a larger share in public procurements. EBIT, EBIT margin show the overall profitability of the business, while quick ratio and net debt ratio relate to the financial and operational efficiency of the firm, particularly debt burden and size of liabilities of the firm. These indicators may be affected by political connections and illustrate the firms' profitability, which increases the wealth of their owners or beneficiaries.

For the model, we also include year-fixed effects to separate the macroeconomic factors, specific for all Ukraine in this period, such as economic recession, devaluation, and inflation after the revolution, among other factors. Because these firms operate in different regions and different industries, we collected their codes (“kved” – code of economic activity in Ukraine) and codes for regions, converted them into categorical variables, and apply them in the model to include industry, year, and region factors on the economic performance of the firm. This is particularly significant to identify the effect of those industries and regions affected more by military conflict, occupation of territories of Ukraine. Including year, industry, and region-fixed effects will help us identify Euromaidan's effect on politically connected firms more accurately.

For approach 2, we will also use the difference-in-difference method to identify the effect of Euromaidan overall (2013-2018), and separately for the short-run effect of Euromaidan (2013-2014) and medium-run effects (2015-2018).

Based on three stages of data analysis, we will identify how Euromaidan and post-Euromaidan period affected the assets of politically connected economic elites of Ukraine.

Description of variables

Our primary independent variable for the study is political connections. We use two approaches for identifying political connections: first, from the Register of Politically Exposed Persons and second from manual identification of affiliation of the person from the list of top-100 richest people of Ukraine in 2010-2018 to the leading of opposition political parties.

The Register of pep.org.ua contains an extended list of people: national and foreign politically exposed persons; politically exposed persons, having political functions in international organizations; associated persons of politically exposed persons; close persons of politically exposed persons. The first circle of PEPs is identified as "individuals exercising or having exercised in the last three years specific public functions in Ukraine." The list also includes people serving in the public field and their associates, who have business and personal connections with family members of national or foreign politically exposed persons. Based on the methodology of the Register, the politically connected people from the list of top-100 richest people of Ukraine are mainly added to the Register as affiliates to politically exposed persons (PEP). The Register was created in 2015 and collects the data since 2013, including the politically connected people during the presidency of Viktor Yanukovych in 2010-2014. Furthermore, the public information of the Register confirms that they are not deleting the information about a politically exposed person from if the person does not hold positions in public service for more than 3 years but puts them in a different section. Therefore, the politically exposed people as for 2013 should be present in the Register today based on the information of public organization "Anti-corruption Action Centre".

For the study, we also assume the political connection in 2013 can also be applied for all the period of presidency of Viktor Yanukovych for 2010-2014. In this period, the affiliates of the Party of Regions and of Viktor Yanukovych were consistently exercising political connections for their enrichment.

For this study, we form a dummy variable using the Register – 1 if the person is present in the list of politically exposed persons for the period 2013-2018, 0 if the person was not in the list.

The second approach of identifying politically exposed people is whether the person belonged to leading or opposition parties during the presidencies of Yanukovych and Poroshenko in 2010-2018. Empirically, we observe that many of the people listed in the top-100 belonged to the leading or oppositions parties for the observed period as members of Parliament, members of political parties, or appointed as public servants.

For categorical variables, we select 3 values of "Pro-Yanukovych", "Anti-Yanukovych" and "No party". The first identifies belonging to the Party of Regions during the Yanukovych presidency, to the Opposition Block after 2014, or

being affiliated with Yanukovych. The last identifies belonging to the opposition party during Yanukovych presidency presented in Ukrainian Parliament for the selected period ("Nasha Ukraina – Narodna Samooborona", "Block Yulii Tymoshenko" or "Svoboda") or leading party during Poroshenko Presidency ("Block Petra Poroshenka", "Narodnyi Front") or being clearly affiliated with its leaders. This research is conducted by using media resources with biographies of people from the list of top-100 richest people of Ukraine for 2010-2018, particularly Liga.net and UBR.ua. The "No party" means that no party affiliation was identified.

The second independent variable was the industry as a categorical value, which is included in the ratings of top-100 of Focus. For 24 people out of 176 from the list of top-100, manual research on their assets needed to be done to identify the key industry of the businessman; we also used the biography description at Liga.net and UBR.ua. The criterion was the industry of at least 50% of the largest assets. While identifying the industry, it was visible that many businessmen from the list of top-100 operate in many various industries, but one was chosen as a key industry, which can lead to the bias in this variable. Because each industry has had its own economic factors of growth, we have included a control variable for the industry in the model.

The third variable is the region of economic activities of businessmen. Because Ukraine has faced military conflict and some regions were affected by the conflict, it was necessary to include regional factors in the model to identify the economic decline caused by assets in conflict-affected territories. The criteria for this variable was where the key assets of a businessman are located, particularly if at least 50% of its largest assets are located in some specific region of Ukraine, then we assume that this region is key for his or her performance. However, in the case of retailers or agro-industry, such region cannot be identified, and we use the value "Ukraine" for them. We use 7 values for the categorical variable as the region of Ukraine – East, West, South, North, Center, Kyiv, and Ukraine. These are the geographical regions of Ukraine, and Kyiv was added because some of the businessmen from the list have their businesses and assets concentrated in Kyiv.

RESULTS

Summary statistics

The data about the top-100 richest people of Ukraine that constitute the sample for the study was taken from the Ukrainian journal Focus that yearly published the list in 2010-2018. Focus has the ratings for all the period of 2010-2018, which is necessary for the study. Mostly the ratings are published as images and pdf files so that we have converted it into panel data in Excel further to analyze data in Excel and R. For these ratings, we have collected the data about assets of 176 people that were present in the list of top-100 in 2010-2018. From this data, our first sample consisted of 43 people from this list who were in the ranking for an entire period of observation that allows us to build the model estimating the effect of Euromaidan on the assets of politically connected people from top-100.

For the identification of political connections of selected 176 people, the register of Politically Exposed Persons of the Centre of Anti-Corruption Action was used. We identified whether a person was present in the list and did not take into account the type of connections and risk assessment identified by Register. Based on this search, from 176 people, 61 people were present in the Register, and 115 were not.

The second approach chosen for identifying political connections was more direct – we identified whether a person belonged to the leading or opposition party present in the Ukrainian Parliament in the period of 2010-2018 or held office in the executive branch of power presidencies of Yanukovych and Poroshenko. Based on our estimations, 49 people out of 176 belonged to pro-Russian parties represented in Parliament in 2010-2018 – Party of Regions or Opposition Block or were appointed on public positions during the presidency of Yanukovych. 21 persons were identified as anti-Yanukovych and belonged to oppositions parties during the presidency of Yanukovych ('Nasha Ukraine – Narodna Samooborona', 'Block Yulii Tymoshenko') and leading parties during the presidency of Poroshenko ('Block Petra Poroshenka',' Narodnyi Front'), or were appointed on public positions during the presidency of Poroshenko. 106 people from 176 were not identified in any of the two groups.

We observe some discrepancies between estimations of the Register of Politically Exposed Persons and our manual search. The discrepancies are presented in Table 1.

Table 1. Comparison of political connections in pep.org.ua (Approach 1) and political affiliation (Approach 2)			
Political connections	In pep.org.ua	Not in pep.org.ua	Total number
Pro-Yanukovych	35	**14**	49
Anti-Yanukovych	10	**11**	21
No direct connection	**16**	90	106
Total number	61	115	176

16 people in the base of pep.org.ua were not identified in our manual search as directly politically connected. The explanation for this is that the Register includes in its list also indirectly politically connected people through business affiliation and personal connections, whereas approach 2 takes into account only direct political affiliations. For example, the so-called oligarchs Pinchuk and Bogoliubov were identified as politically connected in the Register but were not identified as politically connected in our list because they did not belong to political parties and did not hold public positions in the reported period.

On the other hand, 25 people were not included in the pep.org.ua but were in the second list. The reason for this is that pep.org.ua probably did not include in the list of politically affiliated in 2010-2012, where our search also covered members of Parliament of 2007-2012 and politically affiliated with Yanukovych in this period. The list of pep.org.ua was more balanced because it also covered indirect political affiliations. This is important for this study and in the political context of Ukraine when politicians use indirect tools of influence (Markus & Charnysh, 2017).

For independent categorical variables, we have also identified industry and region of business activity of person from top-100. The results for the distribution of the people from top-100 for 2010-2018 among regions and industries in Chart 2 and Chart 3. From this list, industries for 24 businessmen were manually selected, while industry for 152 businessmen was taken from Focus. The regions were identified by manual search.

Chart 2. People from top-100 richest people of Ukraine in 2010-2018 by industries

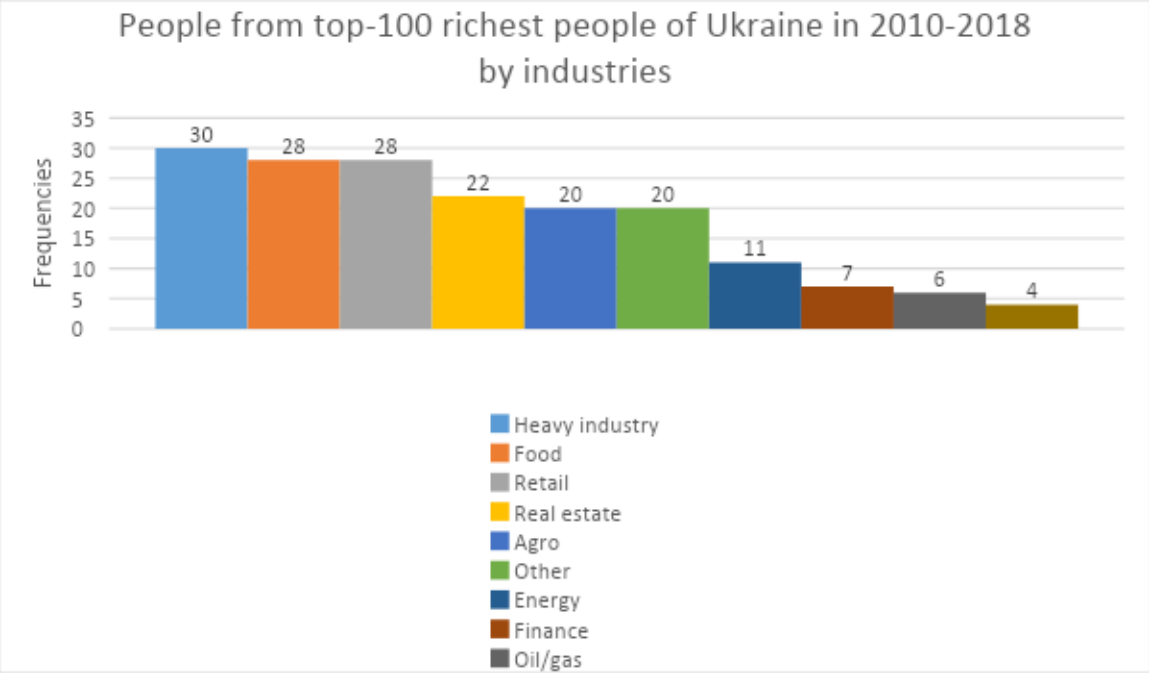
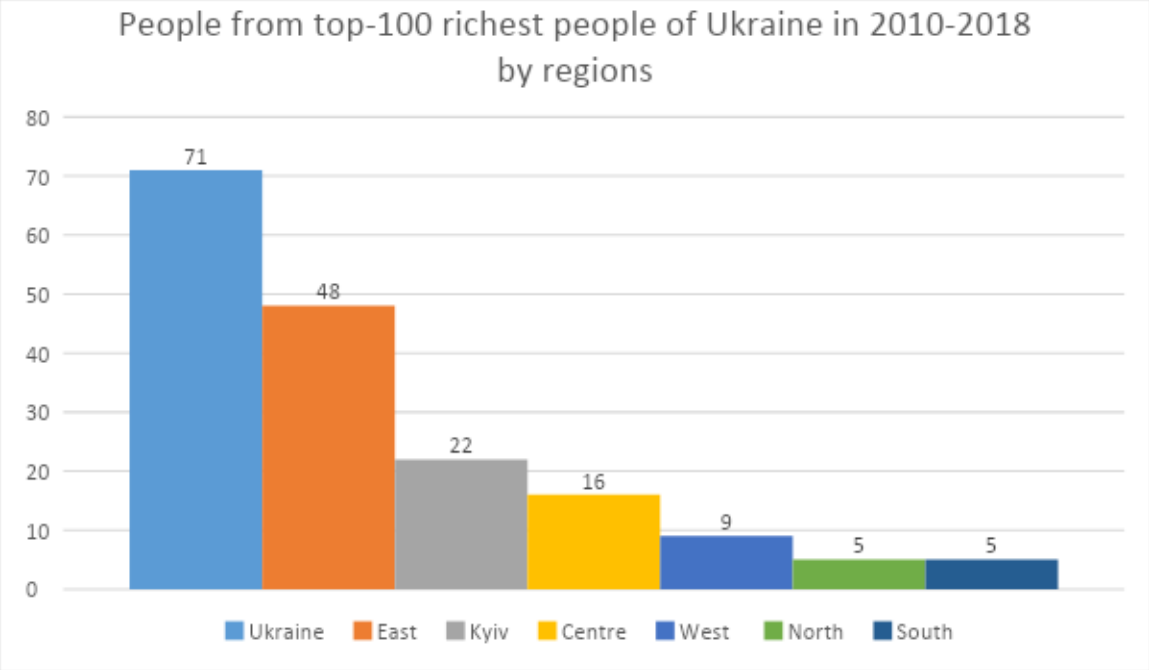


Chart 3. People from top-100 richest people of Ukraine in 2010-2018 by regions



To construct the sample for the second estimation strategy, we identified the list of firms of top-100 in 2010-2018. We have used the databases of the website pep.org.ua, which included the list of assets of politically exposed people, and also the website YouControl that has public information about legal entities of businessmen, where they are founders or beneficiaries. Using this database, we have found the list of firms for 137 people from the list of 176, and could not find the information for 39 people from the list. Overall, we created the database of 3151 firms representing 137 businessmen with their names as legal entities, official codes ("EDRPOU"), and the status of the person from our sample (founder or beneficiary).

From the list of 3151, we were able to find financial statement data for 2316 firms representing 2012-2019, with 13890 firm-year observations for 2012-2019. Unlike the ratings of Focus used for the first stage of analysis, the balances are reported by firms for the previous year, so the reports for 2012-2019 included information about the financial activity of firms in the 2011-2018 fiscal years. These observations were extracted from financial reporting of the enterprises from a database of researchers previously studying the economic performance of Ukrainian firms and their productivity: on firm's balance (form 1 in Ukrainian financial reporting) and report about financial results (form 2).

The following variables were extracted from the balances of firms: EDRPOU (official code of enterprise), name of firm, year (from 2012 to 2019), KVED (code of economic activity), regional code, debt, net debt, revenue, gross profit, assets, EBIT (earnings before interest and tax), tangibility. Also, the economic performance ratios were included in the data: EBIT margin (EBIT/revenue), EBIT/assets, EBIT/net debt,

net debt/revenue, net debt/assets, quick ratio, current ratio. For some middle and large-size enterprises that report their depreciation and amortization, the same ratios for EBITDA (Earnings before interest, tax, depreciation, and amortization) are added.

The data of 13890 observations did not include all the indicators listed above. Particularly, the data included 11600 observations for revenues reported for the firms, 10893 observations for gross profit, 13765 for assets, 13322 for earnings before interest and tax (EBIT), 6255 for earnings before interest, tax, depreciation, and amortization (EBITDA). For EBITDA, the reported observations were lower because only large firms report this indicator in their balances. Quick and current ratios were reported for 12675 observations, debt was reported for 7619 observations.

Descriptive statistics for assets, revenues, gross profit, debt, EBIT, and quick ratio provided in Table 4 in thousands of UAH. We observe high standard deviation and skewness of the data with the high number of outliers, the model for all variables is 0 with many firms reporting 0 in their balances. We also observe negative values for some firms of their revenues, gross profit, and EBIT. The average asset size of the firms is 757.1 thousand UAH, revenues of 637.6 thousand UAH, gross profit of 105.8 thousand UAH, the debt of 168 thousand UAH, the the and EBIT of 35.5 thousand UAH.

Table 4. Descriptive statistics of economic indicators of firms of 138 members of top-100 ranking (2010-2018) for 2012-2019

Assets		**Revenues**		**Gross profit**	

Mean	757141	Mean	637598	Mean	105882
Standard Error	30875	Standard Error	31264	Standard Error	6536
Median	36657	Median	7055	Median	944
Mode	0	Mode	0	Mode	0
Standard Deviation	3638646	Standard Deviation	3684515	Standard Deviation	749057
Kurtosis	150	Kurtosis	189	Kurtosis	302
Skewness	11	Skewness	12	Skewness	15
Minimum	0	Minimum	-115709	Minimum	-6645304
Maximum	91647624	Maximum	104910344	Maximum	25349642
Debt		**Ebit**		**Quick ratio**	
Mean	168808	Mean	35532	Mean	147
Standard Error	8540	Standard Error	4403	Standard Error	37
Median	6	Median	1	Median	0
Mode	0	Mode	0	Mode	0
Standard Deviation	1006451	Standard Deviation	512632	Standard Deviation	4193
Kurtosis	353	Kurtosis	211	Kurtosis	5064
Skewness	16	Skewness	4	Skewness	63
Minimum	-74	Minimum	-14698090	Minimum	0
Maximum	33139244	Maximum	11303165	Maximum	371976

For the first stage of the data analysis, we analyzed the data using descriptive statistics in Excel. Particularly, we calculated the average and distributions of assets, frequencies for categorical variables, compare the descriptive statistics for the people in the list of top-100 before 2014 and after 2014.

After this, we created three samples for 3 regression analysis models we use in the study. The first is clean data only for 43 people with 387 observations for 2010-2018, where people stayed in the list of top-100 during all period of 2010-2018. As stated above, for this sample we will use difference-in-difference method and build the log-linear model with interaction value of political connections and Euromaidan shock (and post-Euromaidan) with assets as the dependent variable.

The second sample is the data for the top-100 richest people of Ukraine in 2012 with 900 observations of their assets in 2010-2018. We added 2 dummy variables whether they dropped in 2013-2014 (1 if dropped), and in 2013-2018 (1 if dropped). Using this data with 900 observations, we used the logistic model with independent binary variables to identify how political connections affected the likelihood of dropping from the list of top-100 richest people of Ukraine after Euromaidan.

The third is sample is 13890 observations with economic performance indicators of 2316 firms and 137 people. We have also applied the difference-in-difference method for this sample using the data from the firm's

economic indicators. We built a log-linear model with interaction value of political connections and Euromaidan shock/post-Euromaidan with independent variables of revenue, gross profit, assets, EBIT (earnings before interest and tax), quick ratio, and net debt.

Findings

The data of assets of top-100 Ukrainian of Focus in 2010-2018 shows a decrease in assets of richest people in Ukraine in the period of 2013-2016 due to the political and economic shock. However, the reduction of assets has already started in 2012 before the actual currency devaluation and military aggression from the Russian Federation. Chart 5 presented below shows the total asset size of the top-100 calculated for 2010-2018.

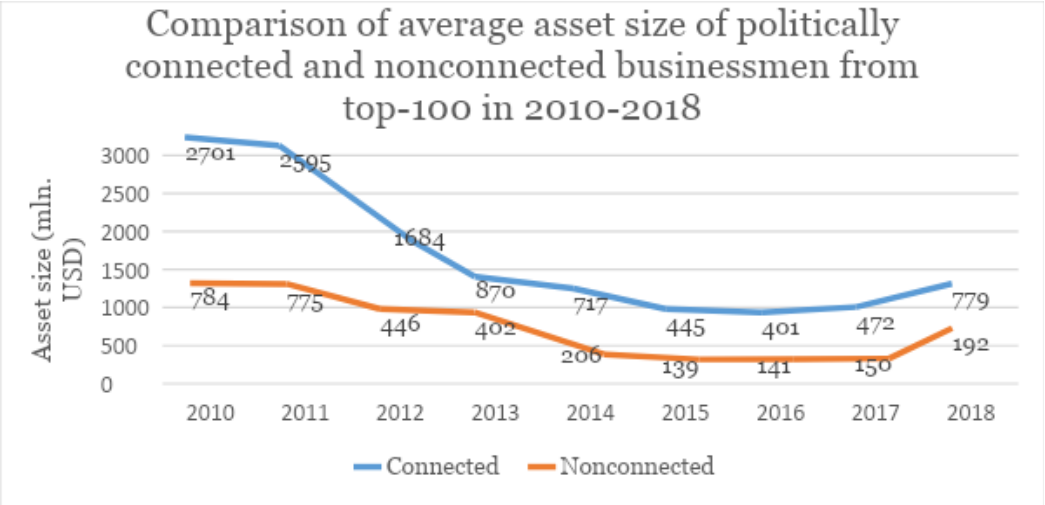
Chart 5. The total asset size of top-100 in Ukraine in 2010-2018 (from Focus ratings)

The decrease in assets has already started in 2012, which may be correlated with slow economic growth and macroeconomic factors. Another observation is that the standard deviation of the assets has decreased in the period between 2012 and 2017. This correlates with the very high volatility of assets of the wealthiest Ukrainian (top-20). The skewness of assets has also decreased from 6,6 in 2010 to 3,5 in 2017.

On average, the assets of politically connected people are higher than those of non-connected people between 2010 and 2018the size of the average asset. The difference between the average asset of politically connected and non-connected businessmen dropped in 2013 and then increased again. This finding correlates with

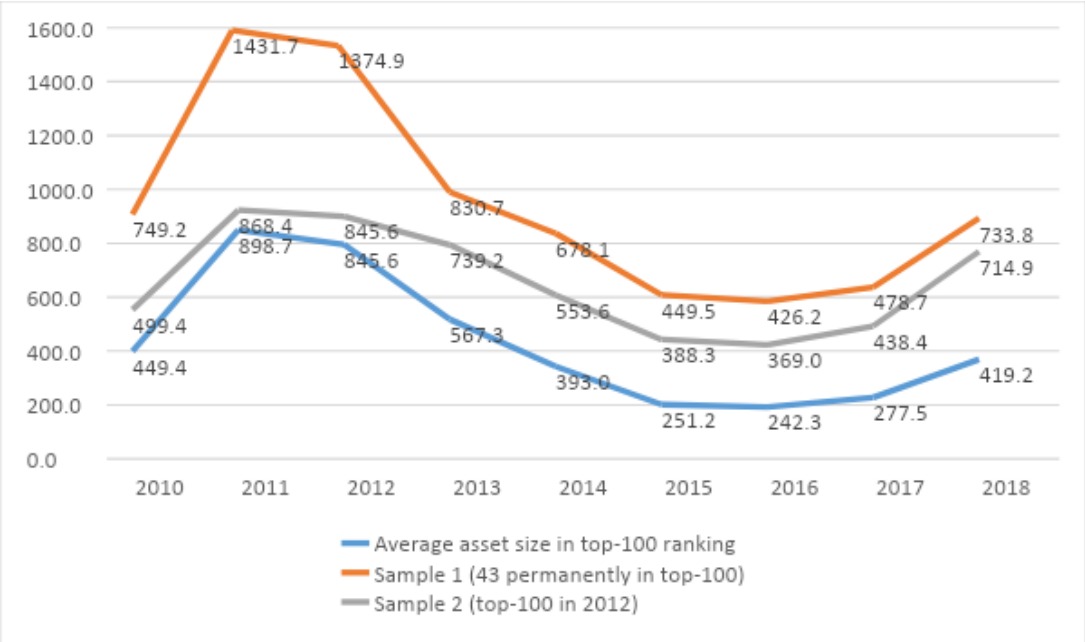
the idea that political turnover worsens their economic performance after the old political chains broke and new political groups took power. Simultaneously, the politically connected people from the list of top-100 in 2010-2018 have higher assets, which are more volatile. Therefore, such a significant drop can also be caused by in difficult macroeconomic situation in Ukraine in 2013-2015. The difference between average assets of politically connected and non-connected businessmen presented in Chart 6.

Chart 6. Comparison of average asset size of politically connected and nonconnected businessmen from top-100 in 2010-2018



For the first sample, 43 businessmen permanently staying in the ranking of top-100, their average asset size is higher than for for all the group in 201-2018, the average assets size for sample 2, assets of top-100 in 2012, the asset size is also higher than for all members of the list in 2010-2018. These results are presented in Chart 7. Because we study the performance of economic elites, the larger average assets sizes for our sample fit the study.

Chart 7. Comparison of average asset size in Sample 1, Sample 2, and top-100 rankings



For the study we have also compared the proportion of politically connected people in the top-100 and compared it to the proportions in samples 1 and 2. Samples of the study have a higher proportion of politically connected people based on the base of pep.org.ua. However, there is also a higher proportion of no-party affiliates based on party belonging. The results are presented in Table 8.

Table 8. The proportion of politically connected people in the ranking of top-100 in 2018, Sample 1 and Sample 2

	Sample 2	Sample 1	Members of top-100 ranking in 2010-2018
Approach 1			
Connected	41%	51%	35%
Nonconnected	59%	49%	60%
Approach 2			
Yanukovych supporters	34%	40%	28%
Yanukovych opponents	14%	12%	11%
No party	52%	49%	61%

The proportion of politically connected people among new people in the list in 2013-2018 is lower than the proportion of politically connected people in 2012. Out of 100 in 2012, 42 people (or 42%) are found in the register of politically exposed people (pep.org.ua). Out of 76 new people in the base in 2013-2018, 20 are found in the

pep.org.ua database or 26,3% of the total number. The number of politically connected people among newbies after 2013. Because the largest change in the structure of top-100 was in 2013 (29 new members), we assume that this list was already calculated in the first two quarters of 2014 when the revolution as a political shock had already happened and affected the economic performance of large businessmen. This is also confirmed by the comments to the rating of top-100 in 2014 (Focus, 2014).

The alternative definition of political connection illustrates that the share of politically non-connected people in the list is lower among new members of the top-100 list. However, we do not observe that political affiliation to Viktor Yanukovych and the Party of Regions prevented ex-Yanukovych supporters from joining the list of top-100 after 2013.

In 2012, 34% of the list belonged to the Party of Regions or were affiliated with Yanukovych. The political pressure on Yuliya Tymoshenko and her political party in 2010-2012 forced some members of Block Yuliy Tymoshenko to join the Party of Regions, they are reported in the base as Yanukovych supporters. 14% of people are reported to be in the opposition, and 52 as not found.

Out of new members of the list in 2013-2018, there is also a higher proportion of politically non-connected businessmen (71%). It correlates with the general observation that out of new people in the list of top-100, the large portion are the retailers and food producers, which are less likely to be affiliated with political parties, unlikely to heavy industry, energy, oil/gas, which is traditionally dependent of political connections. However, the number of affiliates to the Party of Region is twice higher than the number of affiliated to the opposite parties, which confirms the idea that political turnover in 2014 worsened the economic performance of Party of Regions affiliates. The results for the comparison of politically connected members of top-100 before and after 2013 are presented in Table 9. We add 2013 to the year of shock based on the comments of Focus that the ranking prepared in 2013 has already been developed in the circumstances of political shock, which explains a large number of those who dropped from the ranking in this year.

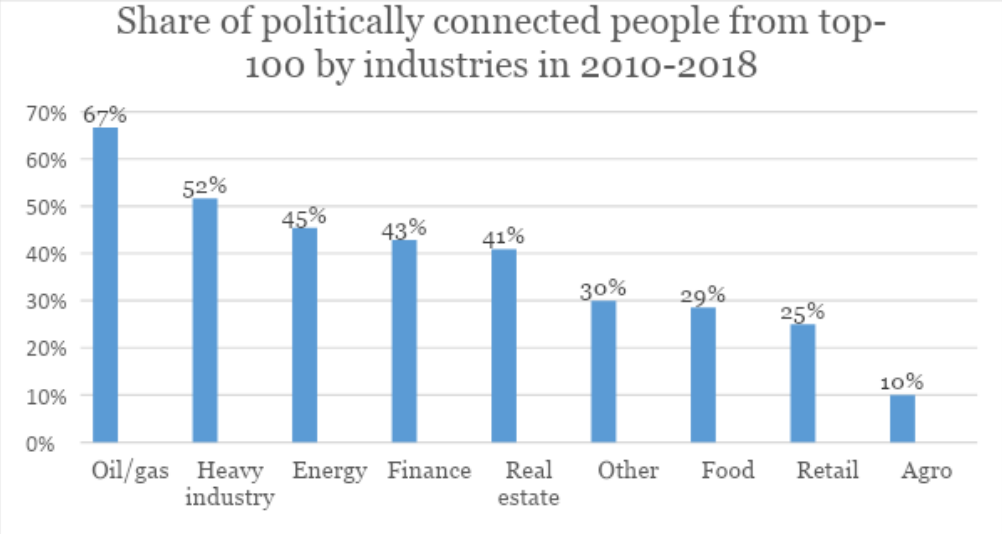
Table 9. The proportion of politically affiliated people from top-100 before and after Euromaidan.

	Pro-Yanukovych	Anti-Yanukovych	Not affiliated
Top-100 in 2010-2012	34%	14%	52%
Top-100 in 2013-2018	20%	9%	71%

Top-100 who dropped after 2013	33%	14%	53%

The proportion of politically connected businessmen is significantly higher among highly capitalized industries, particularly in heavy industry, energy, oil/gas, real estate industries, which correlates with the cross-country studies on political connections in the economy. The share of politically connected businessmen from the list of top-100 in 2010-2018 is lower in agricultural, food, and retail industries. The comparison of the share of politically connected firms by industries before and after Euromaidan, however, does not show any significant trends or findings for specific selected industries. The share of politically connected businessmen to the total number of businessmen in the industry is presented in Chart 10.

Chart 10. The share of politically connected businessmen to the total number of businessmen in the industry among top-100 in 2010-2018.



We have compared the proportion of people by industries in rankings in top-100 and c to the proportions in samples 1 and 2. The proportions are similar, but the Sample size has a significantly higher proportion of heavy industry. The results are presented in Table 11.

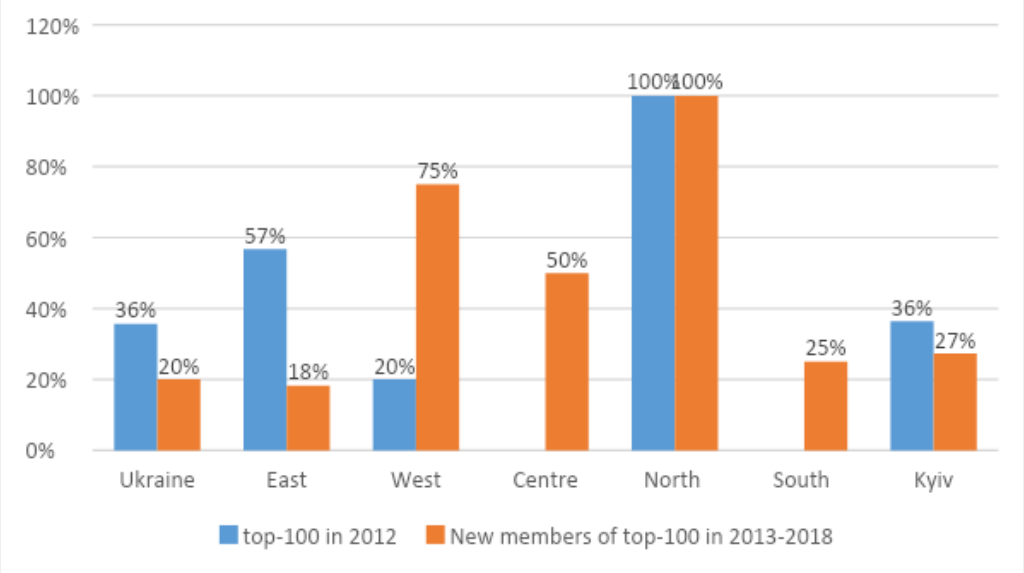
Table 11. Operating industries of people in the ranking of top-100 in 2018, Sample 1 and Sample 2

	Members of top-100 ranking in 2010-2018	Sample 1	Sample 2
Heavy industry	16%	16%	28%
Energy	5%	9%	8%

Agro	11%	7%	10%
Food	16%	16%	12%
Retail	16%	16%	9%
Investment	2%	5%	4%
Real estate	13%	9%	12%
Oil/gas	3%	2%	2%
Finance	4%	5%	6%
Farma	3%	5%	3%
Other	13%	9%	6%

Politically connected businessmen were mainly identified as operating in Eastern Ukraine (38%), in not identifies with the region - all Ukraine (33%) and in Kyiv (11%). The share of politically connected businessmen is higher in Eastern Ukraine and Western Ukraine and slightly lower in Kyiv, Central Ukraine, and if the business is not identified with a region (all Ukraine). The share of politically connected businessmen significantly decreased for top-100 from Eastern Ukraine after 2013, from Kyiv and all Ukraine, but increased for Western Ukraine, Central Ukraine, and Northern Ukraine. The results are presented in Chart 12.

Chart 12. Comparison of share of politically connected people in regions before and after Euromaidan.



Based on the comparison of the distribution of these indicators for politically connected and nonconnected groups (Treatment group 1), politically connected firms are larger and have larger variances than nonconnected for revenues, assets and gross profits, debt, and EBIT. Politically non-connected groups have higher skewness than

politically connected. The results are visualized in Annex 2. The result for EBIT margin reports a negative value for the politically connected and politically non-connected groups.

Difference-in-difference results

The difference-in-difference model shows that Euromaidan in 2013-2014 had a negative change on the asset size of 43 politically connected businessmen that were present in the list of top-100 in 2010-2018. The mean size of assets of the politically connected person (based on Register of Politically Exposed Persons of Treatment group 1) is 70.3% higher than for nonconnected controlled for year, industry, and region. The expected mean change in asset size is 33.8% lower in the politically connected group than in nonconnected after 2013 with year, industry, and region fixed effects. The model shows that after the revolution, the average size of assets of politically connected groups is higher than for nonconnected, but decreased compared to the period before 2013.

As mentioned above, the year of 2013 as a year of shock was used because the ranking of Focus for 2013 was published in April 2014, and the authors affirmed that the revolution has a major effect on their evaluation of asset sizes of the wealthiest Ukrainians. Therefore, based on references of media source Focus, we use the model for 2013 as an intervention time as more meaningful for our study.

The effect of the revolutionary period of 2013-2014 on the asset size of the politically connected group is larger than the effect of the post-Revolutionary period in 2015-2018. The expected mean change in asset size is -43.6% for the politically connected group for 2013-2014 and -28,9% for 2015-2018 controlled for year, industry, and region. This result correlates with the assumption that the political turnover had a negative effect on the enrichment of politically connected group in 2013-2014. Still, its effect decreased in the post-revolutionary period after 2015. In academic literature and reports of international organizations with was also caused by the insufficient implementation of market-oriented and anti-corruption reforms (Wilson, 2016).

For the second approach to identify the political connections by party affiliation to the leading or opposition party between 2010 and 2018 (treatment group 2), we have used the supporters of Viktor Yanukovych and the Party of Regions and his opponents as treatment groups. The model shows that the Yanukovych supporters and opponents held larger assets with fixed effects, the results of the Euromaidan effect are negative and insignificant for both Yanukovych supporters and Yanukovych opponents.

This supports the academic idea that modern Ukrainian politically connected economic elites, so-called oligarchs, have switched from direct support of political parties to indirect instruments of influence after 2004. Indirect instruments are more significant than particular, belonging to the leading of opposition political parties during the presidencies of Yanukovych and Poroshenko. It might explain why identifying indirect influence and affiliations of businessmen in approach 1 showed higher statistical significance.

The results of the difference-in-difference models are presented in Table 13 below, the models are log-linear with dependent variable in the log form.

Table 13. Asset size change after Euromaidan (difference-in-difference method)

Variables	Politically connected (base of pep.org.ua)	Yanukovych supporters	Yanukovych opponents
Model 1			
Euromaidan and post-Euromaidan period (from 2013) * Political connections	-0.338* (0.044)	-0.237 (0.188)	-0.177 (0.518)
Political connections (treatment)	0.703*** (2.87e-06)	0.439 ** (0.005)	1.07456 *** (7.81e-05)
N	387	387	387
R-squared	0.51	0.51	0.51
Model 2			
Euromaidan period (2013-2014) * Political connections	-0.436 (0.04482)*	-0.378 (0.105)	-0.438 (0.217)
Post-Euromaidan period (2015-2018) * Political connections	-0.289 (0.111)	-0.167 (0.391)	-0.047 (0.873)
Political connections (treatment)	0.703*** (2.91e-06)	0.439** (0.00531)	1.074*** (7.86e-05)
N	387	387	387
R-squared		0.51	0.51

For the analysis of people who dropped from the list of top-100 after Euromaidan, we have used the logistic model. The results show that the chances to drop from the list of top-100 in 2012 after 2013 are higher politically non-connected than for connected controlled for region and asset size in 2012. However, all the results are statistically insignificant.

For the treatment group 1 (pep.org.ua), politically connected people from the list of top-100 in 2012 were 30.22% more likely likely to drop from the rating of top-100 than politically non-connected in 2013-2014, and 19.29% less likely to drop between 2013 and 2018. For the treatment group 2, party-based affiliation, Yanukovych opponents were more likely to drop from the list than Yanukovych supporters both for 2013-2014, and for all the period between 2013 and 2018.

Therefore, for these results, an important implication is that the chances to drop for the politically connected group are negative in 2013-2018 and positive in 2013-2014. This supports the idea that political connections strengthened and its effect increased in the post-Euromaidan period in comparison to the Euromaidan period.

For the treatment group 2 with the partisan affiliation of the sample, the results reveal that Yanukovych supporters were less likely to drop from the list of top-100 than his opponents and people with no party affiliation controlled for asset size in 2012 and region. This correlates with the principle of indirect influence of politically connected economic elites and their ability to establish new connections with the new government.

All results are not statistically significant; therefore, we cannot draw any conclusions from the logistic models. The results for the logistic model presented in Table 14.

Table 14. Chances to drop from the top-100 after 2013 for the politically connected group (logistic model)	
Model 1 – chances to drop in 2013-2014 for treatment group 1	
Politically connected (pep.org.ua), drop in 2013-2014	0.264 (0.641)
Odds to drop	30.22 %
Model 2 – chances to drop in 2013-2018 for treatment group 1	
Politically connected (pep.org.ua), drop in 2013-2018	-0.214 (0.69)
Odds to drop	-19.29%
Model 3 - chances to drop in 2013-2014 for treatment group 2	
Yanukovych supporters compared to no party, drop 2013-2014	-0.5528 (0.382)
Odds to drop	-42.46%
Yanukovych supporters compared to no party, drop 2013-2018	-0.0471 (0.935)
Odds to drop	-4.6%
Yanukovych opponents compared to no party, drop 2013-2014	0.821 (0.335)
Odds to drop	127.46%
Yanukovych opponents compared to no party, drop 2013-2018	1.383 (0.123)
Odds to drop	298%
N	100

For the analysis of financial balance indicators of firms of 138 people from the list of top-100 in 2010-2018 for 2011-2018 years, we have applied the difference-in-difference method similarly to the asset analysis presented in Table 15 with year-industry-region fixed effects. The results the presented in Table 15, the models are log-linear with dependent variable in the log form.

For the list of firms used for analysis, we see that politically connected firms share larger revenues, profits, and EBIT based on the base of pep.org.ua. With the data on supporters and opponents of Yanukovych, opponents of Yanukovych on average smaller revenues, gross profit and EBIT in comparison to Yanukovych supporters.

The model did not show the negative effect of Euromaidan on revenues, profits, of politically connected firms. On the contrary, there is a positive effect of Euromaidan on the interaction between political connections and revenues and profits indicators controlled for year, industry, and region.

For revenues of the firm, the expected mean change in revenues is 30.9% higher in the politically connected group than in the nonconnected after 2013 for treatment group 1. For the gross profit of the firms, there are similar results with a higher coefficient for tretment group 1 – 55% higher for group 1. The effect of Euromaidan for treatment group for assets, EBIT (earnings before income and tax), EBIT margin, and NDEBT margin do not show statistical significance.

For treatment group 2, the effect of Euromaidan is positive for EBIT and EBIT margin of firms of Yanukovych supporters, while Yanukovych opponents do not have positive effect of Euromaidan. The list of firms of the sample can be biased and omission of firms of the economic elites operating before the Euromaidan can be explanation why no negative effect of political connection on the firm performance was clearly identified.

The model did not show statistically significant results for the effect of Euromaidan on ratios of politically connected firms. For this study, we do not analyze the operational and financial efficiency of the firms, and these findings are not crucial for the estimation of the wealth of politically connected group. But we see the effect of Euromaidan on revenue and gross profit size. For assets, they are less volatile indicators than revenues and gross profit, which may be why there is no statistically significant effect of Euromaidan for treatment group on assets.

Table 15. Effect of Euromaidan on main economic performance indicators of politically connected firms with industry-year-region fixed effects (difference-in-difference method)

Variable	Revenue	Gross profit	Assets	Ebit	Ebit margin	Quick ratio	Net debt margin
Treatment group 1 (politically connected in pep.org.ua)							
Euromaidan and post-Euromaidan period (from 2013) * Political connections	0.309* (0.015)	0.550*** (0.000)	0.139 (0.243)	0.227 (0.163)	0.142 (0.187)	0.050 (0.691)	-0.149 (0.489)
Political connections (treatment)	0.507*** (1.05e-05)	0.326* (0.025)	0.156 (0.155)	0.456 *** (0.000)	-0.089 (0.364)	0.269* (0.025)	-0.146 (0.464)
N	11744	10893	13765	13322	11489	12675	11478
R-squared	0.40	0.36	0.33	0.41	0.31	0.14	0.23
Treatment group 2 (Yanukovych supporters /opponents)							
Euromaidan and post-Euromaidan period (from 2013) * supporter	0.160 (0.175)	0.11 (0.45)	0.188* (0.046)	0.262 * (0.017)	0.16 (0.117)	0.067 (0.489)	-0.085 (0.467)
Viktor Yanukovych supporter	0.414*** (0.00)	0.563*** (6.16e-06)	0.474*** (< 2e-16)	0.31** (0.002)	0.073 (0.431)	0.357*** (1.35e-09)	0.457*** (0.000)
Euromaidan and post-Euromaidan period (from 2013) * opponents	-0.175 (0.338)	0.10 (0.66)	0.073 (0.322)	-0.395* (0.019)	-0.119 (0.43)	0.06 (0.426)	0.273 (0.128)
Viktor Yanukovych opponent	-0.099 (0.546)	-0.306 (0.154)	-0.692 (< 2e-16 ***)	-0.351* (0.023)	-0.37 ** (0.006)	0.176 (0.023)	-0.036 (0.828)
N	11744	10893	13765	13322	11489	12675	11478
R-squared	0.40	0.36	0.34	0.42	0.31	0.14	0.23

The same model was also applied to evaluate short-term and medium-term effects of Euromaidan on the performance of politically connected firms, results are presented in Table 16. The models are log-linear with dependent variable in the log form. The first coefficient measured the effects of 2013-2015 and the second coefficient – effects of 2015-2018.

There is a larger effect of political connections in the post-Euromaidan period in comparison with the Euromaidan period on revenues and gross profit. For, EBIT and

EBIT margin, there is a statistically significant positive effect in the post-Euromaidan period and no significant effect in the Euromaidan period for treatment group 1. For revenues of the firm, the expected mean change in revenues is 26.1% for the Euromaidan period and 33.3% for the post-Euromaidan period. For gross profit, the difference between the two periods is larger: 31% for Euromaidan and 67.7% for the post-Euromaidan period for group 1. For EBIT and EBIT margin, there are not statistically significant coefficients observed for treatment groups 1in the Euromaidan period but observed in the post-Euromaidan period – increase on 37.8 for EBIT and 22.4 for EBIT margin in the post-Maidan period. This confirms the idea the politicaly connected businesses re-established their connections and increased its impact on economic performance of their firms. The results for quick ratio and ndebt margins are not statistically significant for both periods for 2 treatment groups.

For treatment group 2, during Euromaidan period, Yanukovych supporters reported higher assets comparing to other firms – 27% higher, while Yanukovych opponents had larger decline in EBIT – by 53.2%. This correlated with previous results that firms Yanukovych supporters suffered more from the Euromaidan that firms of their opponents.

In the post-Euromaidan period, there is much larger statistical significance for firm's indicators for both Yanukovych supporters and opponents. His supporters, in 2015-2018, have 25.9 % larger assets, 32.7% for EBIT and 25.7% larger EBIT margin. Yanukovych opponents, on the contrary, do not have positive effect of their political affiliation on their EBIT and EBIT margin, but have negative effect on their assets and positive effect on their quick ratio.

Table 16. Effects of Euromaidan (2013-2014) and post-Euromaidan (2015-2018) periods on main economic performance indicators of politically connected firms with industry-year-region fixed effects (difference-in-difference method)							
Variable	Revenue	Gross profit	Assets	Ebit	Ebit margin	Quick ratio	Ndebt margin
Treatment group 1 (politically connected in pep.org.ua)							
Euromaidan period (2013-2014) * Political connections	0.261 (0.078)	0.31*** (0.075)	0.218 (0.11)	-0.05 (0.780)	-2.645e-03 (0.983)	0.06 (0.673)	0.028 (0.909)
Post-Euromaidan period (2015-2018) * Political connections	0.333* (0.012)	0.677*** (2.50e-05)	0.099 (0.422)	0.378* (0.027)	0.224* (0.050)	0.046 (0.731)	-0.253 (0.263)
Political connections (treatment)	0.507*** (1.05e-05)	0.326* (0.025)	0.156 (0.155)	0.453** (0.002)	-9.025e-02 (0.355)	0.269* (0.025)	-0.146 (0.466)
N	11744	10893	13765	13322	11489	12675	11478
R-squared	0.40	0.36	0.33	0.41	0.32	0.14	0.23
Treatment group 2 (Yanukovych supporters /opponents)							
Euromaidan period (2013-2014) * supporters	0.096 (0.484)	-0.067 (0.683)	0.270* (0.030)	0.060 (0.732)	-0.017 (0.886)	0.004 (0.972)	0.105 (0.633)
Post-Euromaidan period (2015-2018) * Political connections	0.195 (0.114)	0.205 (0.175)	0.259* (0.023)	0.327* (0.042)	0.257* (0.0169)	-0.137 (0.263)	-0.146 (0.484)
Supporters (treatment)	0.414 *** (0.0001)	0.562*** (4.66e-05)	0.310** (0.002)	0.479*** (0.0006)	0.071 (0.441)	0.457*** (3.69e-05)	0.177 (0.32)
Euromaidan period (2013-2014) * opponents	-0.104 (0.626)	0.066 (0.796)	0.205 (0.29)	-0.532* (0.046)	-0.063 (0.725)	0.088 (0.663)	0.24 (0.512)
Post-Euromaidan period (2015-2018) * opponent	-0.216 (0.262)	0.114 (0.632)	-0.50** (0.004)	-0.286 (0.230)	-0.153 (0.337)	0.378* (0.043)	-0.115 (0.736)
Opponents (treatment)	-0.098 (0.545)	-0.306 (0.153)	-0.352* (0.022)	-0.57 ** (0.005)	-0.372 ** (0.006)	-0.035 (0.829)	-0.66* (0.020)
N	11744	10893	13765	13322	11489	12675	11478
R-squared	0.40	0.36	0.34	0.42	0.32	0.14	0.23

Both approaches to identify politically connected people and firms report statistically significant results for particular economic indicators. For the margins,

which show the profitability of the business, the positive effect is observable in the post-Euromaidan period for treatment group 1 and for Yanukovych supporters in the post-Maidan period.

Despite the hypothesis, there is no decline of political connections effect observed neither for political connections from the base of Register of Politically Exposed People (treatment group 1) nor only for supporters of Yanukovych regime (treatment group 2). We can explain it by the limited number of firms observed, no firm-fixed effects included in the model. The explanation could be underrepresentation in the database of the firms affiliated to the list of top-100 richest people of Ukraine before Euromaidan during the presidency of Yanukovych.

For the post-Euromaidan period in 2015-2018 the role of political connections of the firm controlled for year, industry, and region on its revenues, gross profit, and earnings before income and tax increased compared to effect in 2013-2014. This supports the idea that the influence of political connections started increasing in post-Maidan period after political connections were strengthened in line with the insufficient implementation of anti-oligarchic and anti-corruption policies. At the same time, there is statistically significant more positive of effect of political connections on EBIT and EBIT margins for ex-Yanukovych affiliates than for his opponents, which confirms the indirect influence of politically connected economic elites and their ability to renew their connections after political turnovers.

CONCLUSION

The political connections had a positive effect on the size of the assets of the people from the list of top-100 richest people of Ukraine in 2010-2018. This effect is more significant for indirectly politically connected economic elites than for party-connected. This supports the conclusions of numerous reports of international organizations and analytical centers on the existing significant effect of political connections of economic preferences to firms between 2011 and 2018 despite the political turnover (World Bank, 2018).

During the Euromaidan in 2013-2014, the role of political connections on the asset size of politically connected economic elites declined based on the ranking of top-100 richest people of Ukraine in 2010-2018 but remained positive. In the post-Euromaidan period between 2015 and 2018, however, this effect started evading and the effect of political connections on assets started growing again. This effect was not identified for supporters and opponents of Yanukovych. Therefore, can claim that overall the treatment group 1, which was based on belonging to PEP (pep.org.ua) has larger statistical significance and magnitude than treatment group 2 (party affiliation). This corresponds to the idea that economic elites are widely exploiting the instruments of indirect influence that direct party affiliation (Markus & Charnysh, 2017).

The analysis of balances of firms of economic elites of Ukraine did not show the drop in the role of political connections on firm revenues and gross profit after Euromaidan. The comparison of the effect for Euromaidan and post-Euromaidan period, however, shows that the role of political connections on revenues, gross profits, and earnings before interest and tax (EBIT) increased for 2015-2018 compared to 2013-2014 for treatment group 1. The reason why no negative effect was detected after Euromaidan can be caused by the limited database of firms, as we could not find the legal entities registered for 38 people, the majority of whom dropped from the rating after Euromaidan. Therefore, there is a high risk that many legal entities operating before the Revolution were not included in the database. Another important factor is a large scale of tax evasion, transfer of funds to offshore zones, misreporting, which could lead to bias of estimations.

The increasing effect of political connections in the post-Euromaidan period for treatment group 1 confirms the assumption that the indirect influence of politically connected economic elites of Ukraine strengthened back after Euromaidan. After the political turnover, previously connected economic elites are likely re-established indirect political connections with new decision-makers and leading political parties. Furthermore, the positive effect of being a Yanukovych supporter has a positive effect on the EBIT and EBIT margin of firms in 2015-2018. Therefore, we can claim that the support of Yanukovych significantly threatened the economic performance of economic elites after the Euromaidan.

The elimination of the high influence of political preferences on wealthy economic elites and their firms remains central in the reform agenda in Ukraine after Euromaidan. Based on this study, we cannot claim that Euromaidan as a political turnover decreased the role of political connection, but we observe that there is a statistically significant increase in effect between the period of 2013-2014 and 2015-2018. One potential implication of this result is that after the political turnover in countries with a high level of pre-existing influence of economic elites on policy-making and politics, this influence is going to increase in absence of significant implementation of reform agenda in the first years after the turnover.

In a country with indirect instruments of the political influence of economic elites, it is crucially important to focus on the anti-oligarchic and anti-monopolistic reform agenda in the first 1-2 years of the political cycle after the turnover. Because the economic elites are likely to re-establish and strengthen their connections with new policy-makers in legislative and executive branches of the Ukrainian government, the policies targeted at "state capture" preventing mechanisms, particularly restricting particularistic preferences for economic elites, should be adopted in the following years after the political turnover. Afterward, it could be more complicated for the new government to adopt anti-oligarchic policies because the lobby of politically connected economic elites is likely to increase.

Another important implication is that direct affiliation to a political party affects the economic performance of elites less than indirect affiliations. Therefore, the policies in the electoral process should not prevent large businessmen from joining the leading political party but to target more transparent, independent, and sustainable financing of political parties in Ukraine to make them less dependent on the financial support of politically connected economic elites.

After the last two turnovers in Ukraine, the Orange Revolution in 2004 and Euromaidan in 2013-2014, we observe decreasing progress in the reforms and the adaptation of anti-oligarchic policies after the first year after the revolution. If the conventional approach explains this by growing corruption of public officials, another approach illustrated in this study is the growing factor of political connections exploited by economic elites which tend to renew after turnover.

The study has some limitations. Firstly, there is an insufficient database of firms necessary to correctly track the effect of Euromaidan on politically connected economic elites. This database may include the wider range of firms operating in the pre-Euromaidan period and some analysis of offshore companies of economic elites to make more extended conclusions about the role of political turnover. Furthermore, alternative approaches to identify and diversify types of political connections can be helpful to more clearly see the effect of political turnover.

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ANNEX 1. CODE IN R USED FOR THE STUDY.

```
library(haven)
library(readstata13)
library(foreign)
library(reshape2)
require(tidyverse)
library(dplyr)
library(ggplot2)

names(DIploma_MPPG)

reshape(as.data.frame(DIploma_MPPG), times = c(1:43), direction = "long",
      varying = c("2010", "2011", "2012", "2013", "2014", "2015","2016","2017","2018"))

longTOP <- melt(DIploma_MPPG, id.vars = c("Pl","Name","PEP","PC","Sec","Reg","Sup",'Opp'))


# Model for Assets 2010-2018

#Political connections Approach 1 + 2
#2013-2018

long2013 <- longTOP %>%
  mutate(time = case_when(variable == "2013" ~ 1, variable == "2014" ~ 1,
                  variable == "2015" ~ 1,
                  variable == "2016" ~ 1, variable == "2017" ~ 1, variable == "2018" ~ 1,
                  TRUE ~ 0))

long2013$treated = ifelse(long2013$PEP == "1", 1, 0)
long2013$treated = ifelse(long2013$PC== "1", 1, 0)
long2013$did = long2013$time * long2013$treated
didreg = lm(value ~ treated + did + variable  + Sec + Reg, data = long2013)
summary(didreg)


long2013$treated = ifelse(long2013$PEP == "1", 1, 0)
long2013$did = long2013$time * long2013$treated
long2013$did1 = long2013$time * long2013$Sup
long2013$did2 = long2013$time * long2013$Opp
didreg = lm(log(value) ~ treated + did + variable + Sec + Reg, data = long2013)
didreg2 = lm(log(value) ~ Sup + Opp + did1 + did2 + variable + Sec + Reg, data = long2013)
summary(didreg)
summary(didreg2)

#for short-term and medium-term effects
```

```
long2013 <- longTOP %>%
  mutate(time1 = case_when(variable == "2013" ~ 1, variable == "2014" ~ 1,
                    TRUE ~ 0))

long2013 <- long2013 %>%
  mutate(time2 = case_when(variable == "2015" ~ 1,
                     variable == "2016" ~ 1, variable == "2017" ~ 1, variable == "2018" ~ 1,
                     TRUE ~ 0))

long2013$treated = ifelse(long2013$PEP == "1", 1, 0)
long2013$treated = ifelse(long2013$PC == "1", 1, 0)
long2013$did1 = long2013$time * long2013$Sup
long2013$did2 = long2013$time * long2013$Opp

long2013$did5 = long2013$time1 * long2013$Sup
long2013$did6 = long2013$time1 * long2013$Opp
long2013$did7 = long2013$time2 * long2013$Sup
long2013$did8 = long2013$time2 * long2013$Opp


didreg = lm(log(value) ~ Sup + Opp + did1 + did2 + variable + Sec + Reg, data = long2013)
didreg2 = lm(log(value) ~ Sup + Opp + did5 +did6 + did7 + did8 + variable + Sec + Reg, data =
long2013)

summary(didreg)
summary(didreg2)

#2014-2018

long2014 <- longTOP %>%
  mutate(time = case_when(variable == "2014" ~ 1,
                     variable == "2015" ~ 1,
                     variable == "2016" ~ 1, variable == "2017" ~ 1, variable == "2018" ~ 1,
                     TRUE ~ 0))


long2014$treated = ifelse(long2014$PEP == "1", 1, 0)
long2014$treated = ifelse(long2014$PC == "1", 1, 0)
long2014$did = long2014$time * long2014$treated
didreg1 = lm(value ~ treated + did + variable + Sec + Reg, data = long2014)
summary(didreg1)


long2014$treated = ifelse(long2014$PEP == "1", 1, 0)
long2014$treated = ifelse(long2014$PC == "1", 1, 0)
long2014$did = long2014$time * long2014$treated
```

```
didreg1 = lm(log(value) ~ treated + did + variable + Sec + Reg, data = long2014)
summary(didreg1)

#for short-term and medium-term effects
long2014 <- longTOP %>%
  mutate(time1 = case_when(variable == "2014" ~ 1, variable == "2015" ~ 1,
                    TRUE ~ 0))

long2014 <- long2014 %>%
  mutate(time2 = case_when( variable == "2016" ~ 1, variable == "2017" ~ 1, variable == "2018" ~ 1,
                    TRUE ~ 0))

long2014$treated = ifelse(long2014$PEP == "1", 1, 0)
long2014$treated = ifelse(long2014$PC == "1", 1, 0)
long2014$did1 = long2014$time1 * long2014$treated
long2014$did2 = long2014$time2 * long2014$treated

didreg = lm(log(value) ~ treated + did1 +did2 + variable + Sec + Reg, data = long2014)
summary(didreg)


# model for 2011-2018 (as in firms' data)

long2011 <- subset(longTOP , variable != "2010")

long2011 <- long2011 %>%
  mutate(time = case_when(variable == "2013" ~ 1, variable == "2014" ~ 1,
                    variable == "2015" ~ 1,
                    variable == "2016" ~ 1, variable == "2017" ~ 1, variable == "2018" ~ 1,
                    TRUE ~ 0))

long2011$treated = ifelse(long2011$PEP == "1", 1, 0)
#long2011$treated = ifelse(long2013$PC == "1", 1, 0)
long2011$did = long2011$time * long2011$treated
didreg = lm(value ~ treated + did + variable + Sec + Reg, data = long2011)
didreg = lm(log(value) ~ treated + did + variable + Sec + Reg, data = long2011)
summary(didreg)

long2011 <- long2011 %>%
  mutate(time1 = case_when(variable == "2014" ~ 1, variable == "2015" ~ 1,
                    TRUE ~ 0))

long2011 <- long2011%>%
  mutate(time2 = case_when( variable == "2016" ~ 1, variable == "2017" ~ 1, variable == "2018" ~ 1,
                     TRUE ~ 0))
```

```
long2011$treated = ifelse(long2011$PEP == "1", 1, 0)
#long2011$treated = ifelse(long2011$PC == "1", 1, 0)
long2011$did1 = long2011$time1 * long2011$treated
long2011$did2 = long2011$time2 * long2011$treated

didreg = lm(value ~ treated + did1 +did2 + variable + Sec + Reg, data = long2011)

didreg = lm(log(value) ~ treated + did1 +did2 + variable + Sec + Reg, data = long2011)
summary(didreg)


# Logit for chance to drop
Logit_Diploma <-  mydata
attach(mydata)

names(mydata)[1] <- "P"
names(mydata)[2] <- "N"
names(mydata)[4] <- "PEP"
names(mydata)[5] <- "PC"
names(mydata)[6] <- "Sec"
names(mydata)[7] <- "Reg"
names(mydata)[17] <- "D1"
names(mydata)[18] <- "D2"

# Define variables
mydata$PEP <- relevel(mydata$PEP, ref="Nonconnected")
Y <- cbind(mydata$D1)
X <- cbind(mydata$PEP)
# Regression coefficients
olsreg <- lm(Y ~ mydata$PEP + ) # for 2013-2014
olsreg2 <- lm(mydata$D2 ~ mydata$PEP  + mydata$Sec + mydata$Reg) # for 2013-2018
summary(olsreg)
# Logit model coefficients
mydata$Sec <- as.factor(mydata$Sec)
mydata$Reg <- as.factor(mydata$Reg)
logit<- glm(Y ~ mydata$PEP, family=binomial (link = "logit"))
logit<- glm(mydata$D1 ~ mydata$PEP + mydata$Reg + mydata$`2012`, family=binomial (link =
"logit"))
logit2<- glm(mydata$D2 ~ mydata$PEP + mydata$Reg + mydata$`2012`, family=binomial (link =
"logit"))
summary(logit)
summary(logit2)
# Logit model odds ratios
exp(logit$coefficients)-1
exp(logit2$coefficients)-1
```

```
#For political party connection
mydata$PC <- as.factor(mydata$PC)
mydata$PC <- relevel(mydata$PC, ref="No party")
Y <- cbind(mydata$D1)
X <- cbind(mydata$PC)
# Regression coefficients
olsreg3 <- lm(Y ~ mydata$PC)
olsreg4 <- lm(mydata$D2 ~ mydata$PC)
summary(olsreg)
# Logit model coefficients
logit3<- glm(mydata$D1 ~ mydata$PC + mydata$Reg + mydata$`2012`, family=binomial (link =
"logit"))
logit4<- glm(mydata$D2 ~ mydata$PC + mydata$Reg + mydata$`2012`, family=binomial (link =
"logit"))
summary(logit3)
summary(logit4)
# Logit model odds ratios
exp(logit3$coefficients)-1
exp(logit4$coefficients)-1


# Stage 3 - firms

DATAFIRMS
DATAFIRMS$Con[DATAFIRMS$Con==2]<-1
DATAFIRMS$Con[DATAFIRMS$Con==3]<-1
DATAFIRMS$Con[DATAFIRMS$Con==4]<-1
DATAFIRMS$Con[DATAFIRMS$Con==5]<-1
DATAFIRMS$Con[DATAFIRMS$Con==6]<-1

DATAFIRMS$PC[DATAFIRMS$Pro==2]<-1
DATAFIRMS$PC[DATAFIRMS$Pro==3]<-1
DATAFIRMS$PC[DATAFIRMS$Pro==4]<-1
DATAFIRMS$PC[DATAFIRMS$Pro==5]<-1
DATAFIRMS$PC[DATAFIRMS$Pro==6]<-1
DATAFIRMS$PC[DATAFIRMS$Pro==-1]<-0

DATAFIRMS$Anti[DATAFIRMS$Anti==1]<-1
DATAFIRMS$Anti[DATAFIRMS$Anti==2]<-1
DATAFIRMS$Anti[DATAFIRMS$Anti==3]<-1
DATAFIRMS$Anti[DATAFIRMS$Anti==4]<-1
DATAFIRMS$Anti[DATAFIRMS$Anti==5]<-1
DATAFIRMS$Anti[DATAFIRMS$Anti==6]<-1
DATAFIRMS$Anti[DATAFIRMS$Anti==0]<-0
library(ggpubr)
```

```
a <- ggplot(DATAFIRMS) +
  aes(x = revenue, y = Con) +
  geom_point() + xlab("Revenue (UAH)") + ylab("Political connections")

b <- ggplot(DATAFIRMS) +
  aes(x = gross_profit, y = Con) +
  geom_point()  + xlab("Gross profit (UAH)") + ylab("PC")

c <- ggplot(DATAFIRMS) +
  aes(x = assets, y = Con) +
  geom_point()  + xlab("Assets (UAH)") + ylab("PC")

d <- ggplot(DATAFIRMS) +
  aes(x = debt, y = Con) +
  geom_point() +  + xlab("Debt (UAH)") + ylab("PC")

e <- ggplot(DATAFIRMS) +
  aes(x = quick_ratio, y = Con) +
  geom_point() + xlab("Quick ratio (%)") + ylab("PC")

f <- ggplot(DATAFIRMS) +
  aes(x = ebit_margin, y = Con) +
  geom_point()  + xlab("EBIT margin (%)") + ylab("PC")

figure <- ggarrange(a, b, c, d, e, f,
                    ncol = 2, nrow = 3) + ggtitle("Distribution of indicators among politically connected and
nonconnected firms (Control group 1)")


#models
DATAFIRM5 <- DATAFIRMS
DATAFIRM5 <- DATAFIRM5 %>%
  mutate(time = case_when(
    year == "2014" ~ 1, year == "2015" ~ 1, year == "2016" ~ 1, year == "2017" ~ 1, year == "2018" ~ 1,
year == "2019" ~ 1,
    TRUE ~ 0))
DATAFIRM5 <- DATAFIRM5 %>%
  mutate(time1 = case_when(
    year == "2014" ~ 1, year == "2015" ~ 1,
    TRUE ~ 0))
DATAFIRM5 <- DATAFIRM5 %>%
  mutate(time2 = case_when(
    year == "2016" ~ 1, year == "2017" ~ 1, year == "2018" ~ 1, year == "2019" ~ 1,
    TRUE ~ 0))
DATAFIRM5$year <- as.character(DATAFIRM5$year)
DATAFIRM5$obl <- as.character(DATAFIRM5$obl)
```

```
DATAFIRM5$did = DATAFIRM5$time * DATAFIRM5$Con
DATAFIRM5$did1 = DATAFIRM5$time * DATAFIRM5$Pro
DATAFIRM5$did2 = DATAFIRM5$time * DATAFIRM5$Anti


DATAFIRM5$did3 = DATAFIRM5$time1 * DATAFIRM5$Con
DATAFIRM5$did4 = DATAFIRM5$time2 * DATAFIRM5$Con

DATAFIRM5$did5 = DATAFIRM5$time1 * DATAFIRM5$Pro
DATAFIRM5$did6 = DATAFIRM5$time1 * DATAFIRM5$Anti
DATAFIRM5$did7 = DATAFIRM5$time2 * DATAFIRM5$Pro
DATAFIRM5$did8 = DATAFIRM5$time2 * DATAFIRM5$Anti

# for revenues
# for all Euromaidan (2013-2018)
DATAFIRM5 <- subset(DATAFIRM5, revenue != 0 | revenue != is.na(DATAFIRM5$revenue))
didreg = lm(log(revenue) ~ Con + did + year + obl + KVED, data = DATAFIRM5)
didreg2 = lm(log(revenue) ~ Pro + Anti + did1 + did2 + year + obl + KVED, data = DATAFIRM5)
summary(didreg)
summary(didreg1)
summary(didreg2)

# for Euromaidan (2013-2014) and post-Euromaidan (2015-2018)
didreg3 = lm(revenue ~ Con + did3 + did4 + year + obl + KVED, data = DATAFIRM5)
didreg3 = lm(log(revenue) ~ Con + did3 + did4 + year + obl + KVED, data = DATAFIRM5)
didreg4 = lm(log(revenue) ~ Pro + Anti + did5 + did6 + did7 + did8 + year + obl + KVED, data =
DATAFIRM5)
summary(didreg3)
summary(didreg4)


#for profits
# for all Euromaidan (2013-2018)
DATAFIRM5 <- subset(DATAFIRM5, gross_profit != 0 | DATAFIRM5$gross_profit !=
is.na(DATAFIRM5$gross_profit))
didreg3 = lm(gross_profit ~ Con + did + year + obl + KVED, data = DATAFIRM5)
didreg3 = lm(log(gross_profit) ~ Con + did + year + obl + KVED, data = DATAFIRM5)
didreg4 = lm(log(gross_profit) ~ Pro + Anti + did1 + did2 + year + obl + KVED, data = DATAFIRM5)
summary(didreg3)
summary(didreg4)

# for Euromaidan (2013-2014) and post-Euromaidan (2015-2018)
didreg5 = lm(gross_profit ~ Con + did3 + did4 + year + obl + KVED, data = DATAFIRM5)
didreg5 = lm(log(gross_profit) ~ Con + did3 + did4 + year + obl + KVED, data = DATAFIRM5)
didreg6 = lm(log(gross_profit) ~ Pro + Anti + did5 + did6 + did7 + did8 + year + obl + KVED, data =
DATAFIRM5)
```

```
summary(didreg5)
summary(didreg6)


# for assets
# for all Euromaidan (2013-2018)
DATAFIRM5 <- subset(DATAFIRM5, assets != 0 | DATAFIRM5$assets !=
is.na(DATAFIRM5$assets))
didreg5 = lm(assets ~ Con + did + year + obl + KVED, data = DATAFIRM5)
didreg5 = lm(log(assets) ~ Con + did + year + obl + KVED, data = DATAFIRM5)
didreg6 = lm(log(assets) ~ Pro + Anti + did1 + did2 + year + obl + KVED, data = DATAFIRM5)
summary(didreg5)
summary(didreg6)

# for Euromaidan (2013-2014) and post-Euromaidan (2015-2018)
didreg7 = lm(assets ~ Con + did3 + did4 + year + obl + KVED, data = DATAFIRM5)
didreg7 = lm(log(assets) ~ Con + did3 + did4 + year + obl + KVED, data = DATAFIRM5)
didreg8 = lm(log(assets) ~ Pro + Anti + did5 + did6 + did7 + did8 + year + obl + KVED, data =
DATAFIRM5)
summary(didreg7)
summary(didreg8)

# for ebit
# for all Euromaidan (2013-2018)
DATAFIRM5 <- subset(DATAFIRM5, ebit != 0 | DATAFIRM5$ebit != is.na(DATAFIRM5$ebit))
didreg7 = lm(ebit ~ Con + did + year + obl + KVED, data = DATAFIRM5)
didreg7 = lm(log(ebit) ~ Con + did + year + obl + KVED, data = DATAFIRM5)
didreg8 = lm(log(ebit) ~ Pro + Anti + did1 + did2 + year + obl + KVED, data = DATAFIRM5)
summary(didreg7)
summary(didreg8)

# for Euromaidan (2013-2014) and post-Euromaidan (2015-2018)
didreg9 = lm(ebit ~ Con + did3 + did4 + year + obl + KVED, data = DATAFIRM5)
didreg9 = lm(log(ebit) ~ Con + did3 + did4 + year + obl + KVED, data = DATAFIRM5)
didreg10 = lm(log(ebit) ~ Pro + Anti + did5 + did6 + did7 + did8 + year + obl + KVED, data =
DATAFIRM5)
summary(didreg9)
summary(didreg10)

#for ebitda
# for all Euromaidan (2013-2018)
DATAFIRM5 <- subset(DATAFIRM5, ebitda != 0 | DATAFIRM5$ebitda !=
is.na(DATAFIRM5$ebitda))
didreg9 = lm(ebitda ~ Con + did + year + obl + KVED, data = DATAFIRM5)
didreg9 = lm(log(ebitda) ~ Con + did + year + obl + KVED, data = DATAFIRM5)
didreg10 = lm(log(ebitda) ~ Pro + Anti + did1 + did2 + year + obl + KVED, data = DATAFIRM5)
```

```
summary(didreg9)
summary(didreg10)

# for Euromaidan (2013-2014) and post-Euromaidan (2015-2018)
didreg9 = lm(ebitda ~ Con + did3 + did4 + year + obl + KVED, data = DATAFIRM5)
didreg9 = lm(log(ebitda) ~ Con + did3 + did4 + year + obl + KVED, data = DATAFIRM5)
didreg10 = lm(log(ebitda) ~ Pro + Anti + did5 + did6 + did7 + did8 + year + obl + KVED, data =
DATAFIRM5)
summary(didreg9)
summary(didreg10)

# for ebit margin
# for all Euromaidan (2013-2018)
DATAFIRM5 <- subset(DATAFIRM5, ebit_margin != 0 | DATAFIRM5$ebit_margin !=
is.na(DATAFIRM5$ebit_margin))
didreg11 = lm(ebit_margin ~ Con + did + year + obl + KVED, data = DATAFIRM5)
didreg11 = lm(log(ebit_margin) ~ Con + did + year + obl + KVED, data = DATAFIRM5)
didreg12 = lm(log(ebit_margin) ~ Pro + Anti + did1 + did2 + year + obl + KVED, data = DATAFIRM5)
summary(didreg11)
summary(didreg12)

# for Euromaidan (2013-2014) and post-Euromaidan (2015-2018)
didreg11 = lm(ebit_margin ~ Con + did3 + did4 + year + obl + KVED, data = DATAFIRM5)
didreg11 = lm(log(ebit_margin) ~ Con + did3 + did4 + year + obl + KVED, data = DATAFIRM5)
didreg12 = lm(log(ebit_margin) ~ Pro + Anti + did5 + did6 + did7 + did8 + year + obl + KVED, data =
DATAFIRM5)
summary(didreg11)
summary(didreg12)

# for quick ratio
# for all Euromaidan (2013-2018)
DATAFIRM5 <- subset(DATAFIRM5, quick_ratio != 0 | DATAFIRM5$quick_ratio !=
is.na(DATAFIRM5$quick_ratio))
didreg13 = lm(quick_ratio ~ Con + did + year + obl + KVED, data = DATAFIRM5)
didreg13 = lm(log(quick_ratio) ~ Con + did + year + obl + KVED, data = DATAFIRM5)
didreg14 = lm(log(quick_ratio) ~ Pro + Anti + did1 + did2 + year + obl + KVED, data = DATAFIRM5)
summary(didreg13)
summary(didreg14)

# for Euromaidan (2013-2014) and post-Euromaidan (2015-2018)
didreg13 = lm(quick_ratio ~ Con + did3 + did4 + year + obl + KVED, data = DATAFIRM5)
didreg13 = lm(log(quick_ratio) ~ Con + did3 + did4 + year + obl + KVED, data = DATAFIRM5)
didreg14 = lm(log(quick_ratio) ~ Pro + Anti + did5 + did6 + did7 + did8 + year + obl + KVED, data =
DATAFIRM5)
summary(didreg13)
summary(didreg14)
```

```
# for current ratio
# for all Euromaidan (2013-2018)
DATAFIRM5 <- subset(DATAFIRM5, current_ratio != 0 | DATAFIRM5$current_ratio !=
is.na(DATAFIRM5$current_ratio))
didreg15 = lm(current_ratio ~ Con + did + year + obl + KVED, data = DATAFIRM5)
didreg15 = lm(log(current_ratio) ~ Con + did + year + obl + KVED, data = DATAFIRM5)
didreg16 = lm(log(current_ratio) ~ Con + did1 + did2 + year + obl + KVED, data = DATAFIRM5)
summary(didreg15)
summary(didreg16)

# for Euromaidan (2013-2014) and post-Euromaidan (2015-2018)
didreg15 = lm(current_ratio ~ Con + did3 + did4 + year + obl + KVED, data = DATAFIRM5)
didreg15 = lm(log(current_ratio) ~ Con + did3 + did4 + year + obl + KVED, data = DATAFIRM5)
didreg16 = lm(log(current_ratio) ~ Pro + Anti + did5 + did6 + did7 + did8 + year + obl + KVED, data
= DATAFIRM5)
summary(didreg15)
summary(didreg16)

# for ndebt margin
# for all Euromaidan (2013-2018)
DATAFIRM5 <- subset(DATAFIRM5, ndebt_margin != 0 | DATAFIRM5$ndebt_margin  !=
is.na(DATAFIRM5$ndebt_margin ))
didreg17 = lm(ndebt_margin ~ Con + did + year + obl + KVED, data = DATAFIRM5)
didreg17 = lm(log(ndebt_margin) ~ Con + did + year + obl + KVED, data = DATAFIRM5)
didreg18 = lm(log(ndebt_margin) ~ Pro + Anti + did1 + did2 + year + obl + KVED, data =
DATAFIRM5)
summary(didreg17)
summary(didreg18)

# for Euromaidan (2013-2014) and post-Euromaidan (2015-2018)
didreg19 = lm(ndebt_margin ~ Con + did3 + did4 + year + obl + KVED, data = DATAFIRM5)
didreg19 = lm(log(ndebt_margin) ~ Con + did3 + did4 + year + obl + KVED, data = DATAFIRM5)
didreg20 = lm(log(ndebt_margin) ~ Pro + Anti + did5 + did6 + did7 + did8 + year + obl + KVED, data
= DATAFIRM5)
summary(didreg19)
summary(didreg20)

# for debt
# for all Euromaidan (2013-2018)
DATAFIRM5 <- subset(DATAFIRM5, debt != 0 | DATAFIRM5$debt  != is.na(DATAFIRM5$debt ))
didreg19 = lm(debt ~ Con + did + year + obl + KVED, data = DATAFIRM5)
didreg19 = lm(log(debt) ~ Con + did + year + obl + KVED, data = DATAFIRM5)
didreg20 = lm(log(debt) ~ Pro + Anti + did1 + did2 + year + obl + KVED, data = DATAFIRM5)
summary(didreg19)
summary(didreg20)
```

```
# for Euromaidan (2013-2014) and post-Euromaidan (2015-2018)
didreg19 = lm(debt ~ Con + did3 + did4 + year + obl + KVED, data = DATAFIRM5)
didreg19 = lm(log(debt) ~ Con + did3 + did4 + year + obl + KVED, data = DATAFIRM5)
didreg20 = lm(log(debt) ~ Pro + Anti + did5 + did6 + did7 + did8 + year + obl + KVED, data =
DATAFIRM5)
summary(didreg19)
summary(didreg20)
```

ANNEX 2. DESCRIPTIVE STATISTICS FOR ECONOMIC PERFORMANCE INDICATORS OF POLITICALLY CONNECTED AND NON-CONNECTED FIRM IN 2012-2019 USED IN THE STUDY

	Assets, politically connected (in pep.org.ua)	*Assets, politically non-connected (in pep.org.ua)*	
Mean	1085370,83	Mean	398910,183
Standard Error	54481,472	Standard Error	24435,8921
Median	38979,3008	Median	34602
Mode	0	Mode	0
Standard Deviation	4638290,28	Standard Deviation	1991337,8
Sample Variance	2,1514E+13	Sample Variance	3,9654E+12

Kurtosis	95,564336	Kurtosis	338,073577
Skewness	8,56187304	Skewness	15,7656956
Range	91647624	Range	60603356
Minimum	0	Minimum	0
Maximum	91647624	Maximum	60603356
Sum	7866767798	Sum	2649162523
Count	7248	Count	6641
Revenue, politically connected (in pep.org.ua)		*Revenue, politically non-connected (in pep.org.ua)*	
Mean	914940,571	Mean	334906,795
Standard Error	53632,9267	Standard Error	28684,0935
Median	13716	Median	3169,80005
Mode	0	Mode	0
Standard Deviation	4566049,22	Standard Deviation	2337533,64
Sample Variance	2,0849E+13	Sample Variance	5,4641E+12
Kurtosis	138,335045	Kurtosis	201,215113
Skewness	10,0217353	Skewness	13,0252175
Range	105026053	Range	51146217,5
Minimum	-115709	Minimum	-401,5
Maximum	104910344	Maximum	51145816
Sum	6631489255	Sum	2224116023
Count	7248	Count	6641
Gross profit, politically connected (in pep.org.ua)		*Gross profit, politically non-connected (in pep.org.ua)*	
Mean	161496,435	Mean	46316,2513
Standard Error	12154,5786	Standard Error	3556,61645
Median	1343,40002	Median	710
Mode	0	Mode	0
Standard Deviation	1001776,21	Standard Deviation	283214,777
Sample Variance	1,0036E+12	Sample Variance	8,0211E+10

Kurtosis	177,812002	Kurtosis	213,445593
Skewness	11,395831	Skewness	12,7053862
Range	31994946	Range	8048450
Minimum	-6645304	Minimum	-1119621
Maximum	25349642	Maximum	6928829
Sum	1097045285	Sum	293691350
Count	6793	Count	6341
Debt, politically connected (in pep.org.ua)		*Debt, politically non-connected (in pep.org.ua)*	
Mean	224349,246	Mean	108189,434
Standard Error	12928,1586	Standard Error	10902,9542
Median	260	Median	0
Mode	0	Mode	0
Standard Deviation	1100641,2	Standard Deviation	888507,151
Sample Variance	1,2114E+12	Sample Variance	7,8944E+11
Kurtosis	185,636467	Kurtosis	739,045458
Skewness	11,6484561	Skewness	23,6946354
Range	25644121,7	Range	33139244
Minimum	-73,699997	Minimum	0
Maximum	25644048	Maximum	33139244
Sum	1626083335	Sum	718486029
Count	7248	Count	6641

EBIT, politically connected (in pep.org.ua)		*EBIT, politically non-connected (in pep.org.ua)*	
Mean	224349,246	Mean	108189,434
Standard Error	12928,1586	Standard Error	10902,9542
Median	260	Median	0
Mode	0	Mode	0
Standard Deviation	1100641,2	Standard Deviation	888507,151
Sample Variance	1,2114E+12	Sample Variance	7,8944E+11
Kurtosis	185,636467	Kurtosis	739,045458
Skewness	11,6484561	Skewness	23,6946354
Range	25644121,7	Range	33139244
Minimum	-73,699997	Minimum	0
Maximum	25644048	Maximum	33139244
Sum	1626083335	Sum	718486029
Count	7248	Count	6641
EBITmargin, politically connected (in pep.org.ua)		*EBIT margin, politically non-connected (in pep.org.ua)*	
Mean	-66,087633	Mean	143,683408

Standard Error	25,2577658	Standard Error	151,887167
Median	0,02114016	Median	0,01057064
Mode	1	Mode	1
Standard Deviation	1967,83771	Standard Deviation	11192,3426
Sample Variance	3872385,24	Sample Variance	125268533
Kurtosis	3139,85626	Kurtosis	5335,2586
Skewness	-51,299259	Skewness	72,7428657
Range	137392,656	Range	858785
Minimum	-129073	Minimum	-37672
Maximum	8319,65625	Maximum	821113
Sum	-401151,93	Sum	780200,903
Count	6070	Count	5430