CHANNELS OF CORRUPTION IN
ESTABLISHMENT OF SPECIAL
ECONOMIC ZONES IN UKRAINE

by

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Abstract

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Special economic zones (SEZ) were established in Ukraine in 1998-2000 period. We investigated the influence of oligarchs on the government's decision for selection of rayons for SEZ program. The research is done on rayon level with probit regression using Mundlak-Chamberlain approach. The evidence for the positive effect of oligarchs' presence in rayons before SEZs establishment on the selection of treated rayons is found. No evidence is found for the reverse causality checked whether businessmen were attracted to rayons after SEZs were established.

To my Mom

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GLOSSARY

Special economic zones (**SEZs**). Designated areas in countries, which possess special economic regulations that are different from other areas in the same country.

Free economic zones (FEZs). Special economic zones (SEZs) in which companies are taxed very lightly or not at all in order to encourage economic activity.

Territories of priority development (TPDs). Special economic zones (SEZs) designated in distressed regions in order to create new job places with the help of special regime of investment activity.

INTRODUCTION

Special economic zones (SEZs) are commonly referred to as special areas on the territory of a particular state, which are governed by special, usually privileged legal regulation of economic activity thus being one of the regional development instruments. The main purpose of such zones formation is economic development in terms of direct foreign investments attraction, stimulation of production and increasing of export, infrastructure development and new jobs formation (OECD, 2009).

However, the reasons for selection of regional areas as for special economic zones are not always officially stated or at least intuitively logical. Therefore, we followed the idea to investigate the conditions of establishment of special economic zones in Ukraine.

The World Atlas of free Zones (2010) distinguishes 1 735 special zones in 133 countries as of 2009. For instance, China alone has 213 free zones under nine different legal regimes and in 2008 they accounted for around 47 % of the country's total exports.

In Ukraine there were two types of special economic zones, which are free economic zones (FEZs) and territories of priority development (TPDs). According to Ukrainian legislation, the formers are parts of country's territory which are eligible for special legal regime of economic activity treatment; the purpose of FEZs creation to boost economic activity and attract investments. The latter are expected to create new jobs by means of special investment activity regime in

distressed regions characterized by unfavorable socio-economic and ecologic environment.

In their turn, free economic zones are divided in such types (FIAS, World Bank, 2008), which are also represented in Ukraine:

1) Free trade zones are usually treated as duty-free areas separated from national customs territory, where goods may be treated without customs authorities' intervention;

2) Exporting processing areas are oriented for export production and linked to domestic economy in minimal way;

3) Enterprise zones are created for stimulating and revitalizing economic activity in rural areas via tax incentives and subsidies;

4) Freeports cover larger areas, comprehending touristic-recreational activity, retail sales and others;

5) Specialized zones may imply free banking zones, free gambling zones, industrial or logistics parks, airport-based zones, etc.

Overall there are 11 FEZs and 9 TPDs, covering more than 10% of the whole area of Ukraine (see Figure 1). The first special economic zone in Ukraine was North-Crimean Experimental Economic Zone Syvash in the Autonomous Republic of Crimea introduced in 1996. It was established as an experiment and was intended to be shut down in 2001. During the 1998-2000 period another 11 FEZs and 9 more TPDs were established, and they were functioning until March 2005, after that the Cabinet of Prime-Minister Iuliia Tymoshenko passed a resolution to shut the zones off.

According to the OECD report on investment policy in Ukraine (2011), enterprises in special economic zones were exempt from VAT tax. By March 2005 there were 680 of them with the amount of foreign capital of USD 2.5 billion. "The cost of this SEZ tax avoidance and tax evasion represented more than 3% of GDP" (World Bank, 2010b), which is not surprising given tax preferences to enterprises and whole industries in SEZs. Unfortunately, Ukrainian government hasn't foreseen such negative outcomes when establishing the zones. However, the government claimed their motives, but didn't pronounce clear criteria for SEZs selection. Still, the procedure of SEZs establishment is not transparent and does not give clear idea how zones were selected (Sarma, 2007). Therefore, the purpose of this paper is to investigate the background of special economic zones establishment in Ukraine. The main hypothesis is that lobbying effect of large businesses owners (referred to as "oligarchs") is one of the determinants of government decision for areas selection for special economic zones. At the same time we control for general socioeconomic characteristics of areas such as wages, unemployment rate and industrial output growth.

The word "oligarch" is close to the term "business magnate" meaning people who earned their wealth in big business in particular industry or industries. The specifics of Ukrainian oligarchs is that they appeared suddenly back in mid-1990's (Gorodnichenko et al., 2006) when Ukraine stagnated in transition mostly because those people had administrative resources for mass privatization of previously state-owned enterprises. In developed countries in common practice business magnates are not expected to earn a fortune in few years. Another feature of Ukrainian oligarchs is considered to be their control of political life in the country by means of connections to the government in direct or indirect way. Besedina and Coupe (2012) in their unpublished work show that oligarchs protect their interests in two ways: either they deal with politicians and help the latter finance their campaigns in exchange of support in the government promoting favorable laws

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(such form is usually referred to as lobbying) or they gain seats in the Parliament themselves and try to pass laws which are convenient for them. The first problem is that lobbying in Ukraine is not secured in legislation and considered illegal, unlike, for instance, in the USA, where lobbying is institutionally established and regulated. The second problem is that Ukrainian politicians are prohibited to run their own business. Since both forms of lobbying are not legal, we consider oligarch's control of the government and protection of their interests as corruption.

Considering all of this information, we suspect that oligarchs could have controlled the process of establishment of SEZs in convenient for them areas influencing the government for their own benefit. Hence, in our research we consider corruption channels in the establishment of SEZs in Ukraine

The motivation behind the research about special economic zones in Ukraine has several focuses. Firstly, SEZs in Ukraine are not studied widely, though this issue currently hotly debated in policy circles. Secondly, the weakness of existing studies on special economic zones in the world is that they do investigate what happens after the SEZs establishment but do not question the motives and criteria for SEZs selection. Finally, the process of SEZs establishment in Ukraine is obscure due to challenging and painful transition period back in 1990s. Moreover, after the abolishment of special status of zones, the areas themselves lost their benefits, tax incentives, subsidies and financial grants, which intuitively should have led to a decrease in overall level of production and economic activity. However, Nizalova and Vyshnya (2012) in their unpublished research found that it was not actually the case. They concluded that special zone status forfeiture did not have an effect on further economic activity of the regions, which gives suggestions and motivation for further research in that area. One of possible reasons of this result is a short-run effect when in the long-run impact of the closure of SEZs on firms in the regions can be different. However, alternative explanations, which can be found in

further research, are possible. Another explanation for such a phenomenon could be lobbying. Investigation of SEZs establishment and its correlation with the owners of key enterprises in the respective areas and staff of the Cabinet of Ministers in 2005 allows tracing channels of corruption, because lobbying is not legal in Ukraine. The hypothetical reason for that is possible rent-seeking of businessmen: when they have enterprises in some regions, they may want to get some tax preferences or opportunities for legal tax avoidance, so that they can lobby politicians to establish the zones in the key areas.

The major point of Ukraine's SEZs study relevance is that special economic zones may be reestablished. The current President of Ukraine has engaged the former Minister of Economic Development Petro Poroshenko to study the possibility of renewing the law about special economic zones (UNIAN[1], 2012). Analysis of the former situation would be a possibility to predict the effects of potential reform if it is taken. However, three bills were already passed in summer 2012, introducing the possibility of investment activity stimulation in prioritized industries with great tax benefits, though no particular "prioritized" industry is mentioned, which means that any enterprise owner close to certain official may consider his industry "prioritized" and ignore the tax regulation, which actually establishes the offshore jurisdiction within the territory of Ukraine. After that a great probability exists that SEZs will be reactivated and even more channels of corruption will be open, negatively affecting the social welfare.

In this paper we investigate the extent of corruption impact on special economic zones formation. Our hypothesis is that business groups' owners which are sometimes called oligarchs in Ukraine could lobby the government in their favor in order to establish an economic zone with special benefits in the area where their businesses were located.

The number of papers about SEZ is limited; especially it concerns studies of SEZs formation and SEZs in Ukraine. In theory, establishment of free economic zones should have positive impact on the economy giving incentives for FDI, increase of employment and economic growth. Nevertheless, in fact its effect can be indeterminate, it can have negative externalities due to tax revenue redistribution diversification and targeting localization of trade and investments (Grubel, 1982), meaning that by providing preferences to one region government may affect the other one in an adverse way.

This is performed using regional level (rayon) data. A model is developed indicating if the rayon was chosen due to positive or negative economic activity (industrial growth, employment, wages) or due to representatives of businesses from those regions in Verkhovna Rada or among the major oligarchs of Ukraine. This can be a test for hypothesis of corruption channel in SEZs. Therefore, our dependent variable is a binary one controlling whether there was special economic regime in the rayon, the main independent variable represents the level of oligarchs' representativeness in rayons and control variables are economic activity characteristics.

The data for this research is collected in two stages. For the rayon-level the data on economic activity in Ukrainian rayons are taken from the KSE Data Enclave. Additionally, information about Ukrainian oligarchs is taken from the Ukrainian version of Forbes journal (ranking of TOP-100 of the richest people in Ukraine) and other Ukrainian business media. The research is primarily focused on years 1996-2000. The results show the positive effect of oligarchs representation in rayons on the SEZs areas selection.

The rest of the paper is structured in the following way: Chapter 2 provides literature review about the special economic zones; Chapter 3 describes the

methodology used in the research; Chapter 4 gives the description of data used; Chapter 5 gives estimation results and their interpretation; Chapter 6 provides conclusions.

LITERATURE REVIEW

Theoretically, special economic zones are intended to promote economic growth in particular regions where these zones are located. Therefore, studies mostly tried to estimate the real effectiveness of special economic zones, such as impact on employment level or job creation (Jed and Neumark, 2010; Young and Miyagiwa, 1987), increase in business activity (Hamada, 1974), inflow of FDI (Num and Radulescu, 2004; Wang, 2010), etc. Devereux and Chen (1995) expanded Hamada's (1974) conclusion by including such factors as trade volume and terms of trade effect. Finally, FEZs may be introduced in order to assist distressed regions (Nizalov kand Loveridge, 2005).

However, another dimension of FEZs research should be mentioned, which is geographical one, since free zones vary through the countries, and their features and effectiveness depend on location and policy run in respective regions. In many countries, especially in China, the effect of free economic zones is considered as positive. Wang (2010) estimates the effect of special economic zones on regional economies in China and provides support for increasing of capital stock and municipal total factor productivity growth. Meng (2003) estimated large increase in GDP and technology transfer in Tianjin, China. Positive impact of export processing zones on the economy is proven for South Asian countries, such as Bangladesh, India and Sri Lanka (World Bank, 2008). Creation of SEZs may have positive impact even on human development and reduction of poverty how it was shown for India case by Aggarwal (2007). On the other hand, Watson (2001) provided evidence for quite modest effect of special economic zones in Africa. A

wide cluster of literature describes special economic zones in USA, often called enterprise zones, and mainly focuses on the impact of enterprise zone status on labor markets in the areas. Thus, Busso's and Kline's research (2008) found that in USA special economic zones programs were highly beneficial especially for local labor markets, while Jed and Neumark (2010) concentrated on California free enterprise zones and local labor market and found out that the positive effect of those zones is not obvious; Boarnet and Bogart (1996) concluded that special economic zone program turned out to be inefficient in New Jersey and didn't have any positive effect on total employment. Nevertheless, the results of Ham et al. (2011) are supportive for Busso and Kline (2008). However, negative or neutral results of special economic zones programs may be caused by unsound government policy or lack of comparative advantage like it was shown for Pacific island states (Hannesson, 2008).

As regards transition countries, which are far more close to Ukraine, Cieślik and Ryan (2005) suggested that findings for Poland are consistent with previous findings for other countries: establishment of special economic zones actually attracts FDI; but the results are not significant if controlling time effect. Schweinberger (2003) proposes feasible lump-sum taxation and special employment tax/subsidy in order to have positive impact of SEZs on economy. Some countries may choose introduction of SEZs in order to recover from transition crisis (Nyzalova and Vyshnya, 2012) and switch to labor-saving technologies (Onar, 2007). Ukraine has chosen this instrument as the only "panacea" to economic crisis (Maksymenko, 2001).

A popular instrument to evaluate the impact of FEZs is cost-benefit analysis (CBA). This implies a comparison of country's areas treated and non-treated as SEZs. Amirahmadi and Wu (1995) concluded that establishment of export-processing zones in Asia should be supported by rural industrialization and regional

development which eventually should result in liberal economic regime through the whole country. Chen (1993) claimed that SEZs establishment in China may be a lesson for other countries because it was beneficial to the society from the point of view of both economic and social welfare: employment and tax revenue increased, people received new skills by means of technical training and developed infrastructure such as roads and buildings. Warr (1989) developed a simple "enclave model" in order to evaluate costs and benefits for four countries and showed that greatest benefit comes from employment increase. Jayathakamaran (2003) surveyed the literature on the performance of special economic zone regarding cost-benefit analysis framework and concluded that previous findings for Asian countries that establishment of SEZs increases employment and foreign-exchange earnings are consistent.

The costs are usually observable as the amount of taxes underpaid by enterprises eligible for tax preferential treatment; however, the benefits are not always that observable and countable, that is why researches often focus on evaluation of the impact of such policies trying to address the issue of regional development (review of Buss 2001).

Even though there is a research interest in SEZs and their impact on the economic and political environment in the country, there are no studies regarding to the determinants of SEZs establishment.

There are few empirical studies about special economic zones in Ukraine. Mostly Ukrainian SEZs were considered theoretically. Maksymenko (2001) argued that the first SEZ in Ukraine was introduced in order to provide privileges to enterprises which were not profitable and would never increase government's revenue. The same can be assumed for other economic zones promoted after Syvash zone in Crimea. Aslund (2005) also affirmed that free economic zones were closed down

due to huge tax evasion. Tubbin (1999) assumed inefficient FEZs legislation, government intervention and intensive market regulation, which would definitely reduce level of FDI in respective regions. The only empirical evidence for positive impact of FEZs on firms was provided in the preliminary unpublished research by Nizalova and Vyshnya (2012). They analyzed rayons treated as free economic zones or territories of priority development and industries treated as preferential in special economic zones and concluded that in those rayons where SEZs had been established in selected industries employment had increased by 11.2% and wages by 8% at the affected enterprises. However, when analyzing the whole environment, the important finding was that this increase in employment and wages was mostly a reallocation effect from other industries in the treated rayons which means quite modest or no beneficial effect of SEZs establishment in the rayons. Since that time studies about SEZs in Ukraine were not developed and that is why my interest in the topic is so keen.

In general, there is no research about corruption in special economic zones, but there is a study by Gorodnichenko et al. (2006) about the oligarchs. The authors empirically estimated behavior of the oligarchs on a sample of almost 2,000 Ukrainian open joint stock companies. The authors have found empirical evidence for the hypothesis that oligarchs may have positive impact on productivity. This may suggest further research whether the presence of oligarch's business in the rayon selected for special economic zone was beneficial. Moreover, this paper motivated the question about the reverse causality between SEZs creation and businessmen, which is whether rayons selected for special economic zones could attract oligarchs.

When referring to corruption, Corruption Perception Index is used most commonly. The alternative source of data on corruption is firm-level data from the BEEPS report provided by EBRD. The research about cross-regional CPI in

Ukraine was made with national surveys by European Research Association and Kyiv International Institute of Sociology. However, all of these measures do not reflect the lobbying effect in the government's decisions.

Summarizing everything written above, first, my research contributes extra piece to the existing studies about special economic zones in Ukraine, which are not widespread; and second, it gives a starting point in the literature for studies of the motivation and criteria for special economic zones creation and areas selection. At the same time my paper may be applied by both of Ukrainian policy makers and economic policy researchers. The formers may consider the evidence provided and revise their policy of regional development especially regarding to the speculations about the re-establishment of SEZ in Ukraine, and the latters may use the paper as background motivation for similar research in other countries.

METHODOLOGY

As mentioned above, the amount of literature on the subject is limited since the topic is quite narrow. Therefore, it is difficult to follow certain particular methodology, as there are no studies about the determinants of special economic zones selection. That's why we will use an ad hoc approach.

The core model is expected to check empirically whether the SEZs were chosen due to economic activity or due to the lobbying of oligarchs.

We treat special economic zones as both free economic zones and territories of priority development. Though they are aimed to pursue different objectives, they are characterized by almost the same tax preferences and prerogatives. Furthermore, different rayons were selected both as FEZs and TPDs (the number of districts that were subject to regimes of SEZs and TPD – 41s, the number of cities that were subject to regimes of FEZs and TPDs – 58).

Oligarchs' lobby may take place in two forms: either they promote their interests to the politicians whose campaigns are financed by them or they get elected to Verkhovna Rada and pass the required laws directly (Besedina and Coupe, 2012) so that every oligarch having assets in particular area (rayon) could "ask" some politician or vote himself for establishment of economic zone in the very that rayon or rayons. Hence, our dependent variable is rayon selected or not for special economic zone program, and the main independent variable of interest is number of oligarchs represented (=having assets) in the rayon.

At the same time we control for socio-economic characteristics of rayon such as wages, unemployment rate and industrial output growth. These characteristics could also influence the decision of the government to introduce special economic zone in certain rayon.

It's important to admit that SEZs in Ukraine were established at the end of 1990's, in 1998-2000, and at the same time two elections took place in 1998 and 1999 in a row: Parliamentary elections to Verkhovna Rada and Presidential Elections. There is a possibility that businessmen could lobby for creation of special economic zones in preferred areas in change of electorate support guarantees. We consider this as an important issue and also take it under control in the equation.

Therefore, our basic empirical model is the following:

$$Economic\ Zones_i = \beta_0 + \beta_1\ O_{it} + \beta_2\ V_{ijt} + \beta_3\ Y_{ijt} + u_{it} \qquad (1)$$

where *Economic Zones_i* – vector of rayon in SEZ dummy variables taking value of 1 if the rayon is selected for SEZ program;

O_{it} – vector of oligarchs represented (=having assets) in the rayon;

V_{ilt} – matrix of voting indicating level of election results in Ukrainian Parliamentary Elections in 1998 and President Elections in 1999;

Y_{ijt} – matrix of economic characteristics for rayons.

Variable O_{it} reflects discrete number of oligarchs represented in rayons. V_{ilt} represents the percentage of area's population who voted for the winner of the elections in 1998 and 1999 years. Matrix of economic characteristics consists of vectors of average wages in real terms, industrial output growth comparing to 1990 and unemployment rate.

Since we have binary dependent variable, we may use either probit or logit model. Estimating of fixed or random effect model helps to control unobserved heterogeneity. In former case it is more appropriate to use logit model, in latter – probit (Maddala, 1987). We assume that u has a standard normal distribution which leads us to probit. However, we suspect that rayons may have some unobservable characteristics referable both to time variant and time independent effects. In either case it is more advisable to use weights in order to follow the consistency (Xie and Manski, 1988). In this connection we will use weights for population; but this will be a problem for estimating effects in the model since obviously weights for rayon's population won't be the same for all observations in a group. At the same time, in our case it is hard to distinguish between random or fixed effects, because they are both possible. Random effect model addressing time dependent factors requires assumption of no correlation between the effects and regressors, but this assumption may be violated in our case. At the same time rayons differ by time invariant geographical location, industrial structure, climate etc. Regarding mentioned above and the fact that there is no command for probit with fixed effect in Stata we will use Mundlak-Chamberlain approach.

The approach was first introduced by Mundlak (1978) and later modified by Chamberlain (1982) and some others (Wooldridge, 2002 etc.). In the literature it is often called "correlated random effects" framework (Wooldridge, 2010) because it relaxes core random effect model assumption about the independence between explanatory variables and individual effects. The device suggests that the only portion of the time independent dispersion in explanatory variables that can be correlated with residuals must be correlated only with the time and group average of independent variable for each individual.

Unobserved variation can be divided in the following way:

$$Y_{it} = X_{it}*\gamma + c_i + u_{it} \qquad (2)$$

where c_i is fixed individual effect or random individual effect if c_i is uncorrelated with X_t. This effect c_{it} may bias γ is if there is some correlation between X_{it} and c_i.

Therefore, if we need to create a new variable which "controls" time constant variation in X_{it} then the remaining effect should be independent of X_{it}. Mundlak (1978) proposed to introduce vector of all explanatory variables across groups X_i:

$$c_i \,|\, X_i \sim N(\psi + \overline{X\iota}\ \xi, \sigma_a^2) \qquad (3)$$

Chamberlain (1980) suggested adding all the X_i to all time periods instead which helps to indicate fixed effect. Thus the approach addresses both random and fixed effects. That is how Mundlak-Chamberlain approach works. This methodology is additionally attractive because it provides an alternative form of Hausman test.

Summarizing, based on the equation (1) the weighted probit regression will be run for the panel data on rayons for 1996-2000 using Mundlak-Chamberlain approach:

$$Economic\ Zones_i = \beta_0 + \beta_1 O_{it} + \beta_2 V_{ijt} + \beta_3 Y_{ijt} + \beta_4 \overline{O}_{ijt} + \beta_5 \overline{V}_{ijt} + \beta_6 \overline{Y}_{ijt} + u_{it} \qquad (4)$$

where $\overline{O}_{ijt}, \overline{V}_{ijt}, \overline{Y}_{ijt}$ are corresponding variables' means across the group.

In the literature review the issue of reverse causality was mentioned. We address this question, as it might have happened that on the contrary, oligarchs were attracted to particular areas after the SEZs were established. Therefore in new regression we interchange our previous dependent and independent variable. Hence, the equation is the following:

$$O_{it} = a_0 + a_1 Economic\ Zone_i + a_2 Y_{ijt} + a_3 \sum_{ijt} Economic\ Zone_i\ Y_{ijt} + e_{it}, \qquad (5)$$

Variables used for regression (5) are the same as in equation (1) and described above, the only difference is that in the regression (5) data used for years after 2000 till 2005 when all the zones were abolished. Similar to the model (4) we control for socio-economic characteristics Y_{ijt}, because businessmen could be attracted to the rayons by different reasons. For example, they could look for distortions on labor market in order to hire more people or be motivated by lower wages in the region because lower wages mean higher profits for the enterprises owners. At the same time we control for interaction terms between *Economic Zone$_i$* and Y_{ijt} because businessmen could be attracted to particular rayons even to a greater extent as they were given tax advantages and the same time had favorable socioeconomic characteristics. On the one hand, oligarchs could lobby their interests in terms of rent-seeking and assist in establishment of SEZs in particular areas; on the other hand, if those areas were not treated equally compared to all other regions of Ukraine, it means that there were special conditions for business development, which could enrich certain persons. Since the dependent variable is discrete and non-negative, we will use Poisson regression.

In the main regression (1.1) we expect the signs for coefficients and for the marginal effects of main dependent variables to be positive according to our hypothesis. As regards control variables, the signs for economic characteristics may be different because of different motivations regarding to the SEZs establishment. In equation (2) signs are expected dependently on the results in estimation (1.1). If the hypothesis of lobbying effect fails, we expect the alternative reverse causality hypothesis to be confirmed by positive sign on the variable of economic zones. The signs for economic characteristics and interaction term may be also different because of different possible motivation of businessmen.

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Presumably, equations (1.1) and (2) are not simultaneous, since we use different time intervals for them with hypothesis that due to operating activity in those years in particular areas usual businessmen could become oligarchs. Still, further research is possible to give evidence for that.

There are possible econometric problems within the empirical approach. The first one is the question of reverse causality but we already mentioned it and described above. We address this possible problem with equation (2). The second possible problem is omitted variable bias but we also partially address it with the help of Mundlak-Chamberlain fixed effect approach considering that the portion of variation is attributed to the time constant unobservable characteristics. The third possible problem is multicollinearity. We expect it to be suppressed by sufficient number of observations. Additionally, we adjust standard errors for clustering and robustness check.

DATA DESCRIPTION

The data that we will use in the research can be divided in several blocks:

1) Information about rayons and FEZs/TPDs. The source of this information is the web-site of Verkhovna Rada which provides legislation for FEZs and TPDs establishment and closure.

2) Data about economic activity in rayons for years 1996-2005. It includes wages, unemployment rate, industrial output growth, fixed capital investments and population characteristics by rayons. Data was kindly provided by EERC Data Enclave.

3) Data about oligarchs. It's collected manually from different sources. First, the list of TOP-100 Ukraine's Richest People list was analyzed. This rank is published in Ukrainian version of Forbes journal. Secondly, information about biggest business groups in Ukraine was taken from "GVardia" journal. Other publicly available resources were used for data collection. For the first model the main criteria for selection of oligarch or business entity was whether a businessman acquired an asset in rayon before SEZs were established. The second criterion for selection was the ownership or partnership with a rich businessman who has networks in Verkhovna Rada. Sometimes it was obvious, for example, for former Vice Prime-Minister (1997, 2010) Serhiy Tihipko, but in some cases additional piece of information was needed. Mostly, this information concerned about businessmen' funding of some parties.

4) Information about electorate voting on Parliamentary and President Elections in 1998 and 1999 respectively is extracted from the web-site of Central Election Committee of Ukraine. There is information about election results for

different election districts; this information was compiled manually in order to make estimations for rayons.

In general there are 490 rayons in Ukraine and 178 cities of republican and oblast subordination which are also counted as rayons. In total we have 669 areas in total with annual information. Since we have data for 10 years (1996-2005) than the total number of raw observations is 6690; but we are mostly interested is on the equation (1) which implies higher focus on 1996-2000 data (3330 raw observations). There are 1588 actual observations for the regression.

As mentioned previously, there were established 11 free economic zones 9 territories of priority development in Ukraine with 20 treated zones in sum, which results in 91 dummies for treated areas (910 values of 1 for ten years).
First, let's consider statistics for the equation (1.1) that is for years 1996-2000 (before SEZs establishment). The summarizing descriptive statistics is given in Table 1. We can see that on average in 100 rayons there are 34 oligarchs represented in them. For the time interval 1996-2000 average wages were 136.61 UAH, industrial output was growing on 44% on average compared to 1990, unemployment rate was equal 5% on average across the country. In 1998 the Parliamentary elections outcomes were represented by the average of 25% of Ukrainian population voting for Communist Party of Ukraine, who won those elections and gained the majority in the Parliament. In 1999 on average 35% of Ukrainians voted for the winner of President Elections Leonid Kuchma.

It's more interesting to compare data separately for special economic zones and usual areas. We can conclude that in 1996-2000 in treated rayons average wages were higher by 81% on average , unemployment rate on average was lower (see Table 2). It is an interesting finding that in rayons where SEZs were established people on average tended to vote for Communist Party of Ukraine (winner of

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Parliamentary Elections in Ukraine in 1998). The smaller difference is observable for the case of President Elections in 1999. Additionally, as it was expected, there were more oligarchs represented in rayons selected for SEZ program than in usual regions.

We can track time patterns for socio-economic characteristics when investigating trends of wages, industrial growth and unemployment rate separately for treated and non-treated rayons by years (see Tables 3-5).

We can conclude that in treated zones even before SEZs establishment average wages were significantly higher by 21% on average than in non-treated zones and even higher than across the whole country (Table 3). As regards unemployment rate it is also sustainably higher in treated rayons (Table 4). The opposite situation takes place with industrial output growth rate; it is sustainably lower in treated zones before the establishment (Table 5).

C h a p t e r   5

EMPIRICAL RESULTS

As it was discussed in Chapter 3, dummy of rayons locating in special economic zones were regressed on the number of oligarchs represented in the area and matrix of control variables representing rayon's economic characteristics.

The estimation results of model (1.1) are presented in Table 6.

The model was estimated by several different specifications of probit regression. First, we run pooled probit without weights. Second, we ran probit weighted by population. Third, we try pooled probit model with random effect. In the next models we control for whether oligarch had been represented in the rayon before SEZ was established there, thus resulting in regressions in columns 4 and 5. Regression from column 4 from the Table 6 recognizes presence of oligarch in the area within weighted probit regression. Last regression uses Mundlak-Chamberlain approach introducing time constant means within the groups for each individual.

As expected, almost in all regressions we received consistent positive sign for main variables and consistent signs for some controls. Since we've got probit model for binary dependent variable, we cannot interpret and measure the regressions coefficients directly, we may only assume some latent unobservable and immeasurable variable which is represented by dummy taking value of 1 if the latent variable value is higher than zero. However, in the Table 6 we can notice that even for unobservable variable represented by selection of rayon for SEZ program the coefficients are significant and have expected signs. This regards to the main

variable of interest of oligarchs in the rayons and to the results of the rayons' populations voting for the Communist Party of Ukraine on Parliamentary Elections to Verkhovna Rada in 1998. At the same time the coefficients for wages in the rayon are also positive and significant. The same refers to the unemployment rate which suggests that politicians in somehow unobservable way could have been motivated by higher wages and unemployment rate in rayons and especially by voting distributions and location of oligarchs' assets there. Though insignificant, but coefficients on industrial output growth are consistently negative, which is not counter-intuitive as it is quite reasonable to introduce regional development incentives in the areas where industrial output growth is lower. Also, has we assumed before, fixed effect is present within the rayons during given years. Referring to the goodness-of-fit statistics, for the main equation using Mundlak-Chamberlain approach, pseudo-R^2 is estimated in 45%.

However, these are only suggestions, while we are more interested in marginal effects measurement and interpretation. Unfortunately, marginal effects estimations are not very significant in all estimations, but at least they have expected signs (see Table 7). We can see that accounting for omitted variable bias with Mundlak-Chamberlain approach decreases the marginal effect for the variable of oligarchs and makes it even more insignificant which suggest possible endogeneity within the oligarchs variable. Also some measurement errors are possible. The most relevant explanation for insignificant marginal effects: different density of oligarchs' assets through the rayons meaning that the oligarch who had few enterprises in the area might had lobbied SEZ establishment there more aggressively than the oligarch from other rayon having only one firm there.

Still, the coefficients for the voting results in the rayons' on Parliamentary Elections are sufficiently high and rather significant to suggest that some form of political

corruption by means of bribery of voters in the rayons could have taken place by means of that the more people in the rayon voted who voted for the Communist Party of Ukraine in 1998, the conditional probability of that rayon to be selected for SEZ program increased sufficiently.

The results for all regressions show that the hypothesis of lobbying effect is allowed. First, presence of oligarch's business in rayon increased the probability of SEZ establishment there and at the same time effect of lobbying by electoral support guarantees is also present. Also, we can see that politicians sustainably chose rayons with higher wages and higher unemployment for SEZs establishment. Still, there was a higher probability of SEZ establishment if industrial output growth was lower comparing to usual rayons.

For the regression (2) we run OLS and Poisson. The results for the second model are presented in Table 8. As we can notice, there is no evidence for reverse causality we discussed in previous chapters. The coefficients for special economic zones are insignificant and even negative suggesting that oligarchs were not attracted by the opportunities and did not come to the areas where SEZ had been already existed, and it is not contradictory with our expectations. Still, we can see that businessmen when establishing business in rayons after SEZs were oriented on higher unemployment, higher wages and higher industrial output growth rate in the rayon. The coefficient on wages is close to zero though it's significant, meaning that most likely oligarchs did not care about mean wages in the areas when locating their business there. Industrial output growth rate attracted oligarchs only particularly in rayons in special economic zones, while unemployment rate was more important criterion and businessmen oriented on it of whatever area status, which is intuitively logical.

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Even though the marginal effects are not significant, the main hypothesis about the lobbying effect for the selection of rayons for special economic zones establishment in Ukraine is not rejected which applies for presence of corruption channels and gives motivation for further research.

The alternative hypothesis of reverse causality between oligarchs' representation in the rayons and SEZs establishment is not supported. At the same time, we suppose that there were other issues, which could motivate businessmen to locate their business in certain areas. These issues may include, but are not limited to unemployment rate, wages and industrial output growth within the rayons. The attractiveness of regions with higher unemployment and higher industrial output growth rate for business establishment does not contradict the intuition.

CONCLUSIONS

In this thesis we analyzed impact of oligarchs on the selection of rayons for establishment of special economic zones in Ukraine. For the main variables of interest data was collected manually.

Results received allow not rejecting the hypothesis of oligarchs' lobby in the government when establishing special economic zones in Ukraine. We received evidence of positive effect of oligarchs' businesses location in rayons on government's choice of SEZs locations, which gives reasons to think about corruption channels. At the same time, the electoral choice of rayon on Parliamentary and President also had impact on that decision: the more people in the rayon voted for Communist party of Ukraine on the Parliamentary elections in 1998, the higher was probability of selection of that rayon for SEZ program, which also may explained by corruption in the government system. Controlling socioeconomic characteristics we conclude that unemployment rate was also an important criterion for SEZs selection. Since probit framework was employed, marginal effects were analyzed. They are insignificant; it can be explained by potential endogeneity, measurement errors and clustered standard errors, but the intuitive explanation for this matter is different density of oligarchs' business location across the regions. At the same time marginal effects depend on other coefficients; that is why it is hard to predict their significance.

With the help of second model and Poisson regression we tried to address the reverse causality between of oligarchs' businesses location in rayons and SEZs establishment but received no strong evidence for that. Positive signs for significant wages and unemployment rate variables coefficients might motivate

oligarchs to locate their business in particular regions. Unemployment is considered to be more important factor for businessmen.

This paper contributes to the literature about special economic zones and particularly about SEZs in Ukraine; at the same time, it provides motivation for further research with different focuses. First, it suggests studying of SEZs formation conditions and criteria and investigating how transparently they were established. Second, it may motivate one to make a cost benefit analysis particularly for Ukrainian SEZs in order to evaluate whether speculations between socioeconomic welfare and corruption can be beneficial at least for the state budget. Third, the paper's framework may be extended by investigating the density and distribution of oligarchs' assets in particular rayons. Finally, the research greenlights analysis of the same issue not within the latent variable probit framework but employing some observable and measurable variable, like, for instance, voting of deputies in the parliament for passing the law about each special economic zone in particular. The results can be used by policymakers speculating on renovation of SEZ in Ukraine.

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Figure 1. Map of Ukraine and special economic zones locations

FEZ

TPD
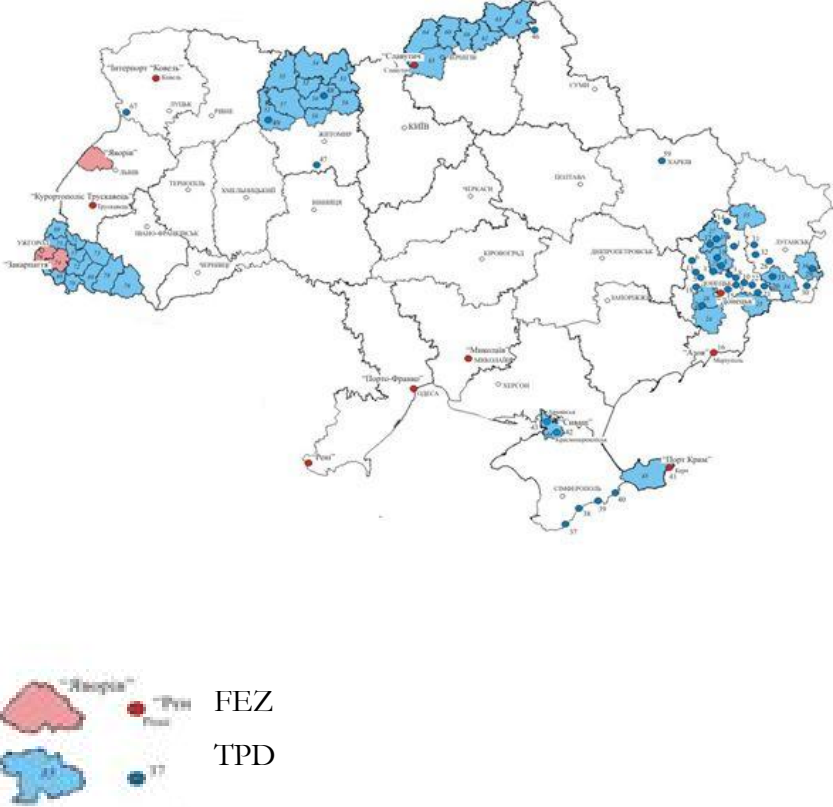
Table 1. Descriptive statistics

N=1588	Mean	Std. Dev.	Min	Max
Oligarchs	0.34	1.78	0.00	25.00
Parliamentary elections 1998	0.25	0.15	0.00	0.53
President elections 1999	0.35	0.17	0.12	0.78
Wages	136.31	61.94	40.07	901.00
Industrial output growth	0.44	0.57	0.01	13.80
Unemployment rate	0.05	0.03	0.00	0.20

Note: Wages are counted in real terms

Table 2. Descriptive statistics for treated and non-treated rayons separately

N=1588	Non-treated rayons		Treated rayons	
	Mean	St. Dev.	Mean	St. Dev.
Oligarchs	0.29	1.71	0.95	2.31
Parliamentary elections 1998	0.24	0.15	0.32	0.14
President elections 1999	0.35	0.18	0.37	0.10
Wages	134.88	59.89	164.87	82.20
Industrial output growth	0.44	0.59	0.44	0.28
Unemployment rate	0.05	0.03	0.04	0.03

Table 3. Mean wages during 1996-1999 for treated and non-treated rayons

		1996	1997	1998	1999	2000
Non-treated rayons	Mean	106.33	120.06	121.19	136.84	167.41
	St. Dev.	38.12	41.66	44.47	54.37	75.29
Treated rayons	Mean	135.15	135.98	142.05	162.30	216.69
	St. Dev.	43.04	54.00	56.38	65.41	108.26
Total	Mean	109.89	122.40	124.06	140.34	174.12
	St. Dev.	39.86	43.99	46.79	56.64	82.23

Table 4. Mean unemployment rate during 1996-1999 for treated and non-treated rayons

		1996	1997	1998	1999	2000
Non-treated rayons	Mean	0.016	0.026	0.044	0.052	0.054
	St. Dev.	0.012	0.019	0.027	0.030	0.030
Treated rayons	Mean	0.019	0.032	0.052	0.062	0.059
	St. Dev.	0.016	0.021	0.030	0.038	0.038
Total	Mean	0.017	0.027	0.045	0.053	0.055
	St. Dev.	0.013	0.019	0.028	0.032	0.031

Table 5. Mean industrial output growth compared to 1990 during 1996-1999 for treated and non-treated rayons

		1996	1997	1998	1999	2000
Non-treated rayons	Mean	0.465	0.393	0.406	0.435	0.534
	St. Dev.	0.442	0.364	0.471	0.520	0.836
Treated rayons	Mean	0.356	0.385	0.393	0.434	0.498
	St. Dev.	0.201	0.227	0.247	0.347	0.391
Total	Mean	0.453	0.391	0.404	0.435	0.529
	St. Dev.	0.424	0.347	0.447	0.500	0.790

Table 6. Estimation results for lobbying effect in probit regressions

	1	2	3	4	5
	SEZ	SEZ	SEZ	SEZ	SEZ
Oligarchs	0.051	-0.0062	0.41*	0.15**	0.15**
	(-0.062)	(-0.068)	(-0.081)	(-0.059)	(-0.074)
Parliamentary elections 1998	2.91*	2.02**	12.9*	7.30*	7.48*
	(-0.67)	(-0.92)	(-2.17)	(-1.97)	(-2.22)
President elections 1999	2.58*	1.14	9.01*	1.18	0.89
	(-0.5)	(-0.9)	(-2.28)	(-3.08)	(-3.47)
Wages	0.0029*	0.0050*	0.019*	0.0063*	0.0068*
	(-0.0009)	(-0.0011)	(-0.0028)	(-0.0014)	(-0.0021)
Industrial output growth	-0.089	-0.072	-0.63**	-0.077	-0.051
	(-0.085)	(-0.18)	(-0.31)	(-0.2)	(-0.21)
Unemployment rate	5.04**	2.15	54.8*	13.0*	10.4***
	(-2.13)	(-3.8)	(-8.76)	(-4.85)	(-5.31)
Fixed effect					present
N	1746	1723	1746	1583	1583
pseudo R-sq	0.09	0.093		0.387	0.446

Standard errors in parentheses ***p<0.10, **p<0.05, *p<0.01

Table 7. Estimations for marginal effects

dy/dx	1 SEZ	2 SEZ	3 SEZ	4 SEZ
Oligarchs	0.0102	-0.0015	0.00368	0.00181
	(-0.0124)	(-0.0165)	(-0.003)	(-0.002
Parliamentary elections 1998	0.586*	0.494**	0.181	0.0887
	(-0.133)	(-0.216)	(-0.147)	(-0.101)
President elections 1999	0.519*	0.28	0.0292	0.0105
	(-0.108)	(-0.214)	(-0.0958)	(-0.0514)
Wages	0.000584*	0.00121*	0.00016	0
	(-0.000183)	(-0.0003)	(-0.0001)	0
Industrial output growth	-0.0179	-0.0177	-0.0019	-0.0006
	(-0.0172)	(-0.0445)	(-0.0049)	(-0.0024)
Unemployment rate	1.015**	0.526	0.322	0.123
	(-0.433)	(-0.9)	(-0.322)	(-0.176)
N	1746	1723	1583	1583

Marginal effects; Standard errors in parentheses (d) for discrete change of dummy variable from 0 to 1, *** p<0.10, ** p<0.05, * p<0.01

Table 8. Estimation results for reverse causality model

	OLS Oligarchs	Poisson Oligarchs
SEZ	-0.33	-0.59
	(-0.86)	(-1.69)
Wages	0.0028*	0.0012*
	(-0.0009)	(-0.00045)
Industrial output growth	-0.019	-0.21
	(-0.034)	(-0.18)
Unemployment rate	-19.8***	-62.8*
	(-10.1)	(-20.1)
Wages	-0.0011	-0.00052
	(-0.0012)	(-0.00088)
Industrial output growth in SEZ	1.26	0.54**
	(-1.29)	(-0.23)
Unemployment rate in SEZ	-5.92	11.6
	(-25.4)	-38.2
N	2816	2816
R-sq	0.15	0.15

Standard errors in parentheses * p<0.05, ** p<0.01, *** p<0.001