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Evaluation of the determinants of shadow economy in selected central Asian countries

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ABSTRACT

This paper focuses on the evaluation of the determinants of the shadow economy in Kazakhstan, Kyrgyz Republic and Tajikistan from 2005 to 2015. Our empirical research shows that determinants can explain more than 80 percent of the scope of the shadow economy in these countries like total labor force, tax rate as a percent of commercial profit, labour participation rate, GDP per capita, imported goods and services as a percent of GDP. The high rate of taxes and total labour force has a positive impact on the scope of the shadow economy because firms evade the taxes pay salaries in "envelopes".

1 Introduction

Tax revenues account for the major part of government budget revenues in most of the developing countries. Therefore these countries should have tax designs that mostly focus on collecting taxes efficiently and on time. However, the shadow economy is considered to be an obstacle to implement the abovementioned objective. It is also referred as an informal economy whose transactions are not recorded in official reports. Therefore, they do not have a contribution to the state budget revenue. Several factors may cause a shadow economy to occur, but major ones are poor tax administration and higher rates of taxes and other mandatory payments. In order to avoid paying high taxes or other mandatory payments, businesses take risks running their activities informally. Another reason is the absence of a special mechanism of collecting taxes or imposing fines in case of tax avoidance. Most developing countries are searching for policies that can help them decrease the shadow economy's scope. In the article, we examine three Central Asian countries – Kazakhstan, Kyrgyz Republic, and Tajikistan. These countries were the parts of the former Soviet Union, and in their economies, there are still some methods inherited from that period. All three countries have been independent for about three decades.

In the early period of their independencies, the shadow economy's scope in these states was very high. According to the data on www.theglobaleconomy.com, the shadow economy (% of GDP) was 46.08, 45.93 and 45.92 in Kazakhstan, Kyrgyz Republic and Tajikistan, respectively. They decreased this indicator by about 15 percent by 2015. The share of the

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shadow economy in Kazakhstan in 2016 increased to 33.5%. In terms of the size of the informal economy, the country ranked 12th in the AT Kearney global ranking. According to the analytical agency, in 2016, the shadow economy of Kazakhstan amounted to 21.8% of the country's GDP, and 10 years before that, it was equal to 22.2% of the gross product. At the same time, from 2009 to 2014, this figure decreased from 34.7% to 30.1%, respectively, and from 2015 it began to grow again. The study showed that the shadow economy in Tajikistan consists of several components. Unpaid taxes, barter transactions, payment of wages and bonuses in natural products, as well as household goods produced for own consumption remain unaccounted for. In Tajikistan, taxation of business is very high – 18 varieties of taxes. A World Bank study shows that taxes "eat up" 87 percent of an enterprise's profits. Only 13 percent remains on premiums, on the expansion of production, on renovation, on marketing costs, and so on.

2 Material and Methods

The causes, effects, and issues appeared because of the impact of the shadow economy discussed for a long time. In order to eliminate or decrease the influence of the informal economy, most developing countries have implemented several tax reforms; however, they were not able to reduce it to the level of their expectations. There have been many types of research regarding the shadow economy's impact. However, the majority of them were about industrial countries or European countries. One significant research has been implemented on "Estimates of shadow economy All over the World". In this paper, the shadow economy's size in almost all countries compared to their GDP is estimated. As causal variables, size of government, the share of direct taxation, Total tax burden, Fiscal freedom, Business freedom, Economic freedom, Unemployment rate, GDP per capita are shown (Andreas Buehn, 2010). Friedrich Schneider and Andreas Buehn, in their paper, define the shadow economy as follows: The shadow economy includes all market-based legal production of goods and services that are deliberately concealed from public authorities for the following reasons:

- to avoid payment of taxes, e.g. income taxes or value-added taxes;
- to avoid payment of social security contributions;
- to avoid certain legal labor market standards, such as minimum wages, maximum working hours, safety standards, etc.;
- to avoid complying with certain administrative procedures, such as completing statistical questionnaires or other administrative forms. (Friedrich Schneider, 2017)

Dominik H. Enste, in his paper as his key finding, shows High taxes and social security contributions, and heavy regulation are the main drivers of the shadow economy. However, according to him, the shadow economy is hard to measure, and different methods yield different results. (Enste, 2018)

However, not all researchers claim that the underground economy has only negatives impacts. According to Gheorghe Zaman and Zizi Goschin, the underground economy as a financial crisis has positives effects, too. In addition, it may be helpful to solve some issues such as high rate unemployment, complementary income for the poor, future usage of black money in the official economy. (Gheorghe Zaman, 2015).

Unlike those researches, our research focuses on the impact of the shadow economy on the economic growth of Uzbekistan. The objectives of our study:

- To find the reasons that cause shadow economy's expansion in developing countries;

- To study the experience of some countries that underwent the same issues regarding underground economy;
- To conduct an empirical analysis to determine significant variables for the expansion of the level of informal economy;
- To develop recommendations and proposals to decrease the impact or level of the shadow economy in developing countries.

The reasons that cause shadow economy's expansion in developing countries

The causes of the shadow economy are different for all regions of the world. However, the complex causes of the existence of the shadow economy in the market will be more diverse.

Usually, there are three groups of factors that contribute to the development of the shadow economy:

1. Economic factors: high taxes (on profits, income tax, etc.). As you know, a tax exemption of more than 50% of profits deprives the company of incentives to vigorous production. The restructuring of economic activities (industrial and agricultural production, services, trade); the crisis of the financial system and the impact of its negative consequences on the economy as a whole;

The move of the economy in the "shadow" is a consequence of the general state of the economy. In the poor state of the formal economy, working in its shadow sector can have many advantages. On the other hand, the crisis state of the economy forces entrepreneurs to look for more attractive niches for their activities. One of them is the shadow sector. The imperfection of the privatization process; activities of unregistered economic structures.

2. Social factors: low standard of living of the population, which contributes to the development of hidden types of economic activity; high unemployment and the orientation of part of the population to receive income in any way;

Increasing unemployment, the flow of refugees, non-payment of wages, etc., are an excellent environment for the shadow economy. People who have lost their jobs or have not been paid for long months agree to illegal, shadow employment conditions. The relationship with the employer is sometimes based only on an oral agreement; no sick leave and vacation pay are paid, dismissal is possible without any social guarantees and even more so without warning. For employers, such relationships are more than profitable: employees are very interested in the fact that the shadow business of the "owner" remains so; employers have uncontrolled power over employees; direct financial benefits consist in the fact that no payroll taxes are paid.

3. Legal factors: imperfect legislation; inadequate law enforcement activities to curb illegal and criminal economic activities; imperfect coordination mechanism for combating economic crime, • insecurity of property rights.

It gives rise to entrepreneurship psychology. The appropriate economic behavior is based on whether property rights can be violated sooner or later, and the existing legislation and law enforcement practice do not guarantee their reliable protection. It is necessary to use the available opportunities to the maximum. If you can avoid paying taxes and maximize your profit in all ways, this should be done.

Experience of some countries that have undergone shadow economy issues

Although most developed countries have nearly reduced the level of the shadow economy, developing countries are still suffering from its consequences. According to the report on "Reducing the Shadow Economy through Electronic Payments" by EY Poland (2016), in

2014, the total shadow economy (the sum of unreported consumer cash transactions) was most prevalent in Bosnia and Herzegovina (25.5% of GDP) and Serbia (20.7% of GDP). On the other hand, the smallest shadow economies relative to GDP were in the Czech Republic (11.3%), Poland (12.4%) and Slovenia (12.5%).

The countries studied differ in the share of passive and loyal components in their shadow economy. In particular, the Czech Republic is the country with the highest proportion of passive (90.6% in 2014) and, therefore, the lowest proportion of the obligatory component (9.4%). In contrast, Bulgaria and Croatia have a relatively high share of the committed shadow economy (39.2% and 32.1% in 2014, respectively). Despite these differences, the passive component is the overwhelming majority of the unregistered economy for all countries.

The sector that supplies food, beverages, and tobacco plays the most important role in the passive shadow economy. This conclusion applies to all countries analyzed. On average, this sector accounts for 39.6% of the entire stagnant shadow economy. The sector, which ranks second concerning its contribution to the size of the passive shadow economy, differs among the countries analyzed. These are fuel for vehicles in Bosnia and Herzegovina (9.4% of the total passive shadow economy), Bulgaria (9.4%) and Serbia (8.6%); the sector of restaurants, bars and cafes in Croatia (8.7%), the Czech Republic (12.5%) and Slovakia (9.7%); and the sector of automobiles and motorcycles with related services and repairs in Poland (9.4%) and Slovenia (15.2%). Other sectors that have a relatively high share in the overall passive shadow economy in the analyzed countries include transport, as well as clothing and footwear.

Most people may have an opinion that only unregistered business are the causes for shadow economies. However, some operations of registered entities may also impact the increasing level of shadow economy within a country.
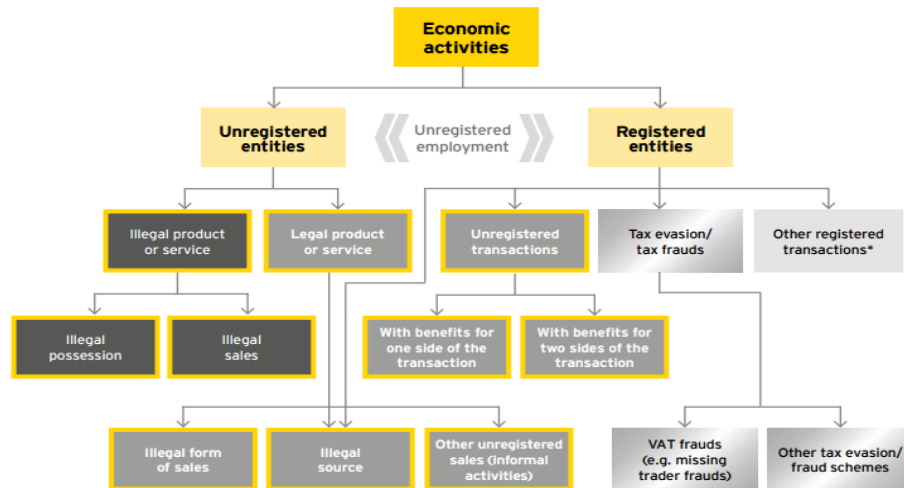
Fig. 1. Different elements of the shadow economy.
Source: EY Poland, Economic Analysis Team and EY Poland, Business Tax Advisory.

Chart 1.1 shows that tax fraud or tax evasion is also possible with registered transactions paid for in cash or electronically. One example is the missing trader's fraud; when a deal is reported, an invoice is issued, payment is made, but the seller "disappears" without paying Value Added Tax (VAT). Therefore, the fact of registration of the transaction may be insufficient to

ensure the collection of taxes. Additional measures are necessary to resolve such issues, but they are beyond the scope of this report. It shows that unregistered entities and registered entities have contributed to the increase or existence of the shadow economy in a country.

In general, it is quite challenging to determine the scope of the shadow economy in a country because there are several obstacles to implement this task. They are as follows:

1) Businesses that operate in a shadow economy stay unnoticed.
2) There is a lack of data to determine the significant factor to the shadow economy

3 Results and Discussion

Three Central Asian countries were chosen to determine the significance of some factors on the shadow economy in developing countries. Data regarding those countries has been collected using the data on www.data.worldbank.org and www.theglobaleconomy.com to evaluate the significance of factors. The period ranges from 2005 to 2015 because of the absence of data before 2005.

Table 1. Independent variables and their description

Independent variables	Brief description
Total labour force, thousands (X_1)	A number of the currently active population. (World Bank data)
Total tax rate, percent of commercial profits (X_2)	The total amount of tax and other mandatory payments paid by companies as a share of their profits (World Bank data)
Labour force participation as a percent of the working-age population (X_3)	Labour force participation rate as a percent of total population (World Bank data)
GDP per capita (X_4)	GDP per capital based on the PPP (World Bank data)
Imports of goods and services (as a percent of GDP) (X_5)	Good and services received from other countries (World Bank data)

Source: Author's compilation

In the multiple regression analysis, Shadow economy (% of GDP) is a dependent variable(Y) and total labor force (in thousands), total tax rate (% of companies' profit), labor force participation (% of the total population), GDP per capita and import of goods and services (% of GDP) are taken as independent variables. Before the regression analysis, the correlation between these variables has been determined.

Table 2. Correlation between variables

	Y	X_1	X_2	X_3	X_4	X_5
Y	1.0000					
X_1	-0.5457	1.0000				
X_2	0.8878	-0.6440	1.0000			
X_3	-0.8204	0.7469	-0.8655	1.0000		
X_4	-0.5626	0.9866	-0.6494	0.7222	1.0000	

| X_5 | 0.2877 | -0.8342 | 0.2970 | -0.4184 | -0.8374 | 1.0000 |

Source: Author's calculations

Table 2 illustrates the correlation between the variables. We can see that there are strongly positive and negative correlations between several variables. Shadow economy (% of GDP) has a strong positive correlation with total tax rate (0.8878), while it has a strong negative correlation with labor force participation (-0.8204). The strongest positive correlation (0.9866) can be seen between the total labor force and GDP per capita, while the strongest negative correlation (-0.8655) total tax rate and labor force participation. There is almost no correlation between imported goods and services and the shadow economy. Moreover, the correlation between the total tax rate and imported goods and services can be considered to be non-existent. It was established to what extent the aggregation of selected variables explains the scale of the shadow economy in selected countries of Central Asia over the study period using multiple regression analysis. In statistical theory, regression is referred as the measurement of the relationship between variables, linear and non-linear dependence (Martišius, 2014). Multiple regression is performed when the number of independent variables to be checked is more than one. As Martišius (2014) recognizes, multiple regression is not deeply described and is widely used in scientific research. For this reason, multiple regression was chosen for empirical research calculations to contribute to the practical application of this analysis and verify whether multiple regression analysis can provide reasonable results. For multiple regression, the following equation will be used:

$$Y = \beta_0(constant) + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5$$

Here Y represents shadow economy (% of GDP), Total labour force, thousands (X_1), total tax rate, percent of commercial profits (X_2), labour force participation as a percent of the working-age population (X_3), GDP per capita (X_4) and imports of goods and services (as a percent of GDP) (X_5).

Table 2. Multiple regression analysis

Shadow Economy (% of GDP)	Coefficient (β_i)	Standard error	t-Statistics	P>|t|
Total labour force (X_1)	.0015987**	.0007463	2.14**	0.041
Total tax rate (X_2)	.1322049***	.0317688	4.16***	0.000
Labour force participation (X_3)	-.1482785**	.0596203	-2.49**	0.019
GDP per capita (X_4)	-.0003075	.0002519	-1.22	0.233

Buvsara Tashmuradova[1], Omonullo Hamdamov[2], Shokhjahon Elmurodov[3]

Imported goods and services (X_5)	.0536817*	.0317471	1.69*	0.102
Constant	30.41928***	5.489597	5.54***	0.000
Number of observations	33			
R-squared	0.8408			
Adjusted R-squared	0.8114			
Note: *, **, *** are significant respectively to p<0.05, p<0.01, and p<0.001				

Source: Author's compilation using STATA

According to Table 3, we can sum up that more than 80 percent of the scope of the shadow economy in Central Asian countries can be explained by factors included in our regression analysis. Labour force participation and increased GDP per capita decrease the overall scope of the shadow economy. However, statistically, GDP per capita is not significant with a t-value of -1.22. An increase in the total labor force and tax rate cause the scope of the shadow economy to increase in Central Asian countries. High tax rates lead people to tax evasion and increase the shadow economy's scope. Because of the increase in the total labor force, illegal employment level rises, and salaries are paid in envelopes.

4 Conclusion

According to the research and regression analysis, the following conclusions were developed:
1) Unregistered firms and registered ones run informal activities that increase the scope of the shadow economy. In Tajikistan, the tax rate in commercial profit is very high, and therefore businesses use barter and other transactions to avoid higher taxes. In Tajikistan, the scope of the shadow economy is higher than in neighborhood countries, and it keeps rising.
2) Calculations showed that total labour force, total tax rate, labour force participation, GDP per capita and imported goods and services are the main determinants of the scope of the shadow economy in Central Asian countries. An increase in the total labour force and tax rate in commercial profit has to make a shadow economy scope increase. However, the active participation of working-age people reduces the scope.

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