

ICT support of Open Budget as a tool to fight corruption: cases of EAEU countries

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ABSTRACT

The paper analyses anti-corruption effects of Open budget policies and practice for five Eurasian Economic Union countries (Armenia, Belarus, Kazakhstan, Kyrgyzstan, and Russia). We engage the data of international organizations which analyze current situation in these countries. We assess the impact of open finance data (according to Open data inventory, ODIN, produced by Open Data Watch) on corruption for five EAEU countries covering the period between 2015 and 2020 with use of unbalanced panel data analysis.

CCS CONCEPTS

• **Computing / technology policy;** • **Government technology policy;** • **Governmental regulations;**

KEYWORDS

Open budget, Open government, Corruption, Anti-corruption efforts, EAEU, Post-Soviet countries

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1 INTRODUCTION

IMF Guidelines for fiscal transparency contains the most complete definition: "Fiscal transparency means openness to the public in regard to the structure and functions of government, objectives of fiscal policy, public sector accounts and forecasts. It provides easy access to reliable, comprehensive, timely, understandable and comparable across countries information about government activities in order that voters and financial markets can accurately assess the financial position of the government and the true costs and benefits associated with the activities of government including its current and future economic and social consequences" [17]. OECD Best Practices for Budget Transparency defines budget transparency as "full, timely and systematic disclosure of fiscal information" [27].

Before 1991, countries of the Eurasian Economic Union (EAEU), namely, Armenia, Belarus, Kazakhstan, Kyrgyzstan, and Russia,

were a part of the Soviet united budget system. The collapse of the Soviet Union and the subsequent appearance of independence allowed the countries to conduct independent fiscal policies. All the countries implemented a number of reforms, as a result of which fiscal policy organizations were modified, new fiscal institutions were established and new legal bases were created.

In Eurasian context, the development of open government has been associated with e-government services that aimed at providing large volumes of information and data in electronic form and via electronic channels as part of the public information disclosure and openness policies. It was assumed that more open public administrations would lead to the increased interactions between authorities and citizens, one side, and between political actors, on other side.

According to the Open Budget Index, drawn up by the International Budget Partnership, Citizen's participation in budgeting is one of the main components of Open Budget. At the same time, an open budget is the first step towards participatory budgeting, similar to how e-Information disclosure is the initial step of e-Participation, in accordance with the UN eGovernment Survey.

We consider "electronic participation" a set of methods and tools that provide electronic interaction between citizens and government in order to take into account the opinions of citizens in national and municipal administration when making political and managerial decisions. The authors are of the opinion that it is necessary to use an expansive interpretation, since actually it is difficult and impossible to separate a "pure" policy from its manifestations that directly concern the life of citizens. Thus, we expand the scope of civic participation including projects of Open Budget.

The rapid expansion of open data technologies has opened up new opportunities for Open Government advocates and initiatives creating numerous cases and practices of such use. In many cases such technologies have been driving Open Government initiatives and, in fact, converged with the latter. However, the question remains unanswered – whether open data change public institutions and practices? Answering this and other related questions would require taking a closer look at open budget.

The measurement and evaluation of socio-economic and political effects of open data, including the impact on government transparency and corruption level, still remain debatable. In this study we use the term "corruption" in the narrow sense, meaning "corrupt practices", e.g. "forms of bribery". "Bribe" is considered as "money etc. offered to procure (often illegal or dishonest) action or decision in favor of giver" [37]. Being broadly defined (for instance, as "the abuse of public office for private gain") [35] this term, in our opinion, not only becomes indefinite, but overshadows the very fact that there are two parties participating (and often interested) in corruption.

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Table 1: Studies of Open Budget effects

Effect	Literature on Open Budget
Budget saving	Williams (2014) [40]
Increase in social expenditures	Khagram, De Renzio, Fung (2012) [21]
Identification of ineffective state programs and institutions / Improving their effectiveness	Andreula, Chong, Guillen (2009) [2]
Increase / decrease in trust to government	Grimmelikhuijsen, Meijer (2014) [16]
Growth / decline in level of democracy	Ruijter, Grimmelikhuijsen, Meijer (2017) [31]
Increase / decrease in level of crime	Bolgov et al. (2016) [7]
Increase / decrease in corruption	Bastida, Benito (2007) [3], Kolstad, Wiig (2009) [22], Sedmihradska, Haas (2012) [33], Cimpoeru (2015) [10]
Detection of public funds misuse	Rajshree, Srivastava (2012) [30]
Increase / decrease in financial fraud	Bolgov et al. (2016) [7]
Country Credit Rating	Khagram, De Renzio, Fung (2012) [21]
Investment Growth / Decrease	Khagram, De Renzio, Fung (2012) [21]
Inflation rate, stock quotes, exchange rates	ODDC conceptual framework (2013) [26]

The hypothesis of the study is the following: open budget implementation within the existing government bodies can decrease corruption. The hypothesis is tested using secondary data analysis. Empirical foundation of the research is formed by publicly available indices of international organizations.

2 LITERATURE REVIEW

A number of researches studying the role of new ICT in tackling corruption analyze the experience of countries with different level of income and democracy. Among them we should mention works of Gronlund [16], Bertot, Jaeger & Grimes [5], Twinomurini & Ghartey-Tagoe [38], Davis & Fumega [14], Ben Ali & Sassi [4], Kossow & Dykes [23] and many others, as well as reports of international organizations, such as Organization for economic co-operation and development (OECD) [28] and Asian Development Bank [1]. Moreover, the problem was discussed on the platform of international academic conferences [9].

However, we tend to agree with Bhattacharjee and Shrivastava stating that 'while prior studies have demonstrated that ICT is an important tool in reducing corruption. . . , they provide little explanation as to how ICT influences corruption and when does it work best' [6]. It is difficult, on the other hand, to accept their idea 'ICT use reduces corruption by increasing the certainty and celerity of punishment for corruption' [6].

The open data effects on corruption are studied by Machova [25], Hulstijn, Darusalam & Janssen [19], and other authors. Several international organizations attempt to measure open data effects on corruption, such as Open Budget Index (OBI) by International Budget Partnership (IBP), Global Open Data Index (GODI) by Open Knowledge Foundation, Open Data Barometer index (ODBI) by World Wide Web Foundation, OURdata (Open, Useful, Reusable Government Data) Index by OECD and European Public Sector Innovation Scoreboard.

Literature on Open Budget effects on corruption can be divided into several groups: studies of political and legal framework of budget transparency and openness [18]; studies of the strengths and weaknesses of the Open Budget evaluation tools [34]; studies

of Open Budget tools application (for instance, in public healthcare) [11]; case studies of countries' experience at municipal, regional and national levels, as well as comparative studies [8].

As for the national case studies of Open Budget in EAEU countries, it is worth noting the studies of the technical aspects of Open Budget [29], institutional and legal aspects [38]. Some publications focus on the study of Russian experience at the national level [36], others have focused on studying the experience of Russian regions and municipalities [20, 29], and others compared the Russian experience with a foreign one [36]. Lindgren and colleagues find a correlation between the level of democracy and open government policies in post-Soviet countries. In Russia and Belarus, the policy of data disclosure is aimed at legitimizing the regime within the country, while in Central Asia it is aimed at legitimizing on international arena in the eyes of the world community [24].

Table 1 demonstrates some findings in literature on Open Budget effects.

To sum on, almost all the studies confirm more or less positive effect of open (budget) data on the struggle against corruption. In other words, these factors help to make the level of corruption lower. However, it is worth mentioning some authors [22] who note that greater access to information may raise the cost of corrupt and rent-seeking behavior, because the costs of discovery may outweigh the benefits of a corrupt act for the government official.

3 EAEU COUNTRIES POSITIONS IN INTERNATIONAL RANKINGS

Struggle against corruption for many years has been the core task of governments, including those who have entered the international community more recently. It is necessary to mention the states formed on the ruins of the Soviet empire. Relying on the data provided by Transparency International, all states can be divided into three groups: the first one is formed by the countries where corruption in economy and social life is low, the second one is characterized by the activity aimed at tackling corruption with fluctuating outcome, the third one is characterized by the corruption existing in freedom.

Table 2: Assessment of Open budget practices in EAEU countries by international organizations

	IBP, 2019	Open Data Index. Gov.Budget. 2015 http://global.census.okfn.org/	ODIN 2020, Rank/ Score,
Russia	74 out of 100 points, category “countries that provide important budget information”	10%	58 of 187 / 59 56
Kazakhstan	48 out of 100 points, category “countries that provide only some of the budget information”	70%	53 of 187 / 62 39
Belarus	0-20: category “countries that do not provide enough budget information”.	-	67 of 187 / 57 50
Armenia	No information	-	69 of 187 / 57 78
Kyrgyzstan	Index raised from 8 points in 2008 to 55 points in 2017. Recommendation to increase budget transparency.	70%	95 of 187 / 48 67

Table 3: Breusch-Pagan Lagrange Multiplier Test

H0 : Var (u) = 0	Random Effects, two sided: LM (Var(u)=0)	= 101.16 prob.>chi2(1)	= 0.000
Chi2 (1) = 101.16 (Prob. > chi2 = 0.0000)	ALM (Var (u)=0)	= 232.06 prob.>chi2(1)	= 0.000
	Random Effects, one sided: LM (Var(u)=0)	= 9.84 prob.>N(0,1)	= 0.000
	ALM (Var (u)=0)	= 14.91 prob.>N(0,1)	= 0.000
	Random Effects, two sided:		

The countries of the first group (score equal to or between 50 and 79) are Estonia, Lithuania, Latvia, and, to a great extent, Georgia. The second group (score equal to or between 29 and 49) consists of Armenia (ranking 60th of 179), Belarus (63th), Kazakhstan, Moldova, Ukraine, Kyrgyzstan, Azerbaijan, and Russia. Uzbekistan (ranking 146th), Tajikistan (ranking 149th) and Turkmenistan (ranking 165th) are in the third group (score less than 29) [12, 13].

The assessment of EAEU countries policies and practice by international organizations is accompanied by a generalization and structured data presented in Table 2.

4 RESEARCH APPROACH AND FINDINGS

We assess the impact of open finance data (according to Open data inventory, ODIN, produced by Open Data Watch) on corruption for five EAEU countries covering the period between 2015 and 2020 with use of unbalanced panel data analysis. Data accessibility was crucial for the choice of sample and period.

The regression model shown below is designed according to the literature:

$$CPI_{it} = \beta_0 + \beta_1 AQ_{it} + \beta_2 ODIN_{it} + \varepsilon_{it} \quad (1)$$

where CPI is Corruption Perceptions Index, RQ - regulatory quality, ODIN - Open data inventory (category “Government Finance”). The

data are obtained from Transparency International, World Bank, and Open Data Watch. The software used for the econometric analysis was "Stata 12". In the model, the RQ is taken as control variable, and ODIN as an explanatory variable. For the RQ indicator, values between (-2.5) and (+2.5) were used.

The variables were tested with ADF PP and ADF DF unit root tests in order to check whether they are stationary or not. The auto-correlation presence is tested with ALM test. Breusch and Pagan Lagrange Multiplier test is used to check whether random effects model or pooled model is suitable (see Table 3).

Then Hausman Specification Test was applied to test null hypothesis suggesting that random effect is suitable (see Table 4).

$$Chi2(4) = (b - B)' [(V_b - V_B)^{-1}] (b - B) = 10.35$$

$$Prob. > chi2 = 0.0043$$

We can see that random effects estimator is not efficient in the model. The heteroscedasticity in the model is tested with Levene and Brown-Forsythe Tests. The auto-correlation presence is tested with Durbin-Watson Test, Lagrange Multiplier Test (LM) and Adjusted Lagrange Multiplier Test (ALM).

Table 5 demonstrates that the null hypothesis of homoscedasticity is rejected and it is determined that there is a heteroscedasticity

Table 4: Hausman Specification Test

Variables	Fixed Effects	Random Effects	Difference
RQ	-0.5072416	-1.699474996	1.192233944
ODIN	-0.52389876	-0.926282394	0.402383635

H0: Differences in coefficients not systematic. (RE estimator is consistent)

Table 5: Levene, Brown and Forsythe Heteroscedasticity Test and Auto-correlation Test

Levene, Brown and Forsythe Heteroscedasticity Test
W0 = 2.2803179 df (45.103) Pr > F = 0.00010208
W50 = 0.9664029 df (45.103) Pr > F = 0.45164099
W10 = 2.2803179 df (45.103) Pr > F = 0.00010208

Auto-correlation test

Serial Correlation: LM (lambda=0)= 0.00 Pr>chi2(1) = 1.000 ALM (lambda=0)= 130.90 Pr>chi2(1) = 0.000

Joint Test: LM (Var(u)=0), lambda=0) = 232.06 Pr>chi2 (2) = 0.000

Table 6: Panel Regression Results

Variables	Dependent Variable: CPI (INVERSED CPI)	
	RE	RE_ROBUST
RQ	-1.6994	-1.6994 (-7.39)
ODIN	-0,9262 (-8.71)	-0,9262 (-1.92)
R ²	0,7379	0,7379
Wald Chi2 (Prob.)	150,29 (0.00)	124,59 (0.00)
Obs.	151	151

problem in the model. As there is not enough observation, Durbin Watson test results cannot be checked. However, ALM and LM test results demonstrate the presence of first-degree autocorrelation in the random effect model.

In the model there are heteroscedasticity and auto-correlation problems. That's why we assess estimators that are robust to heteroscedasticity and auto-correlation problems (see Table 6).

The Corruption Perception Index evaluates the perceived level of corruption in the public sector on a scale from 0 (highly corrupt) to 10 (very clean). This index was changed from 0 (very clean) to 10 (badly damaged) in order to avoid confusion in the interpretation of the signs of the score coefficients.

The explanatory variable (open government finance data, ODIN) has the expected sign and statistically significant. The control variable (Regulatory Quality, RQ) has a positive and statistically significant effect on corruption. There is a positive (CPI inversed) and statistically significant relationship between Open data inventory (category "Government Finance") and the corruption (CPI). In other words, open government finance data can make corruption lower.

5 CONCLUSION

We analyzed the effect of open budget (according to Open data inventory, ODIN, produced by Open Data Watch) on corruption for five EAEU countries covering the period between 2015 and 2020. Our hypothesis about positive open budget effect on corruption

in EAEU countries was confirmed. We found out that regulatory quality and open budget can effect on decreasing the corruption level.

Disclosure of budgets data on the national, regional and municipal level may have the following opportunities for struggle against corruption. First of all, citizens and private sector can analyze open budget data, and this is followed by campaigns against corruption. Secondly, an open budget helps to see which budget programs are not being fulfilled.

We can conclude that the EAEU countries significantly differ in anti-corruption and open budget policies and practices, as well as in rankings of international organizations.

At the same time, the similar problems in the EAEU countries should be noted:

- With the launch of open budget projects, the involvement of citizens and experts in the process of formulating goals was not clarified by law, i.e. there is a lack of a comprehensive understanding of the need for these projects both from the side of representatives of the authorities and from citizens.
- It is necessary to provide additional initiatives in the form of support for civil and expert initiatives in the field of open budget, transparency and reporting; implement projects in the field of secondary processing of budget information.
- According to Gaidar Institute of Economic Policy, in the draft Russian federal budget, the government classified almost 25%

of expenses (compared to 8% in the United States, while the share of security costs is much higher than in Russia). Similar problems are typical for Belarus and Kazakhstan. In addition, experts of Gaidar Institute of Economic Policy noted an increase in security costs. In their opinion, only citizens with special knowledge can deal with the open budget of Russia [32].

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