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THE IMPACT OF BEHAVIOURAL PREREQUISITES AND INSTITUTIONS ON THE WELFARE OF COUNTRIES

Ruben A. Gevorgyan[1], Gayane K. Gevorgyan[2]

Abstract: Human behaviour and institutions are two closely linked concepts. Historically, institutions have been created as a mechanism for limiting human behaviour that exists in a particular social environment. At the same time, the established institutions form certain stereotypes of behaviour or so-called accepted norms of behaviour themselves. One of the most important prerequisites for the successful development of society is the harmonisation of formal institutions and accepted norms of behaviour. Inconsistency of formal institutions with accepted norms of behaviour leads to an increase in transactional costs of institutions' functioning, which has a negative impact both on development prospects and on the welfare of countries.In the present article the mechanisms of institutional influence on the accepted norms of behaviour and on the welfare of countries are discussed. The data on traffic accidents are used, which provide information on both the development of institutions and the overall behavioural conditions in different countries. The structural equation model has been applied to a sample of 50 countries and it has been shown that, along with formal institutions, behavioural prerequisites also have a significant impact on countries' welfare. Institutions influence the welfare of countries not only directly, but also through their influence on existing norms of behaviour. At the same time, the model of structural equations with latent variables makes it possible to assess the level of institutions' impact on the welfare of countries through the influence of behavioural prerequisites.

Keywords: behavioral prerequisites, institutions, welfare of countries, traffic accidents, opportunistic behaviour.

JEL classification: E02, D91,C51, C52.

1. Introduction

Institutions are important for economic development. This thesis of North has long been beyond doubt. According to the definition (North, 1990: 3), "institutions are the rules of the

[1]*Doctor of Economics,Professor,Chair of Mathematics Methods in Economicsat the Faculty of Economics and Management, Yerevan State University, Republic of Armenia;E-mail: rubengevorgyan@ysu.am*
[2]*Laboratory Assistant at the Faculty of Economics and Management, Yerevan State University, Armenia; E-mail: gayane.gevorgyan@ysu.am*

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game in society or, more formally, the constraints created by man that define relationships between people". The development of institutions is one of the main components of economic growth (Acemoglu and Robinson, 2008).The main objective of the institutions is to create rules and measures for their observance to ensure conditions for sustainable and effective development of society. In other words, institutions are designed to limit people's behaviour in order to create conditions for living and working together. If we compare these two theses, then human behaviour, or more precisely, the component of behaviour that cannot be effectively regulated by institutions (both formal and informal) is also important.

Generally speaking, formal institutions are as successful as they take traditions into account and comply with historically established norms of behaviour in society, which are sometimes called informal institutions. It is not always the case that certain institutions help to create favourable conditions for economic development. For example, the level of trust in society, which is a necessary factor for successful business, depends on the proper interaction between formal and informal institutions. Simply copying successful formal institutions in a particular community without taking into account existing informal institutions sometimes leads to depressing results. At the same time, formal institutions can influence existing norms of behaviour by creating more favourable conditions for doing business and living together.

Both formal and informal institutions, even ideal ones, cannot fully enforce the prescribed rules, at least because of the exorbitant transaction costs required to create the conditions for their enforcement or to enforce them. Any rules and measures designed to enforce them leave a chance for at least minor violations. In such a situation, the tendency of people to commit minor violations comes to the fore. Above, when we talked about the component of behaviour that cannot be effectively regulated by institutions, we meant precisely that tendency to commit minor violations. In an article written by Sargsyan and Gevorgyan (Sargsyan and Gevorgyan, 2019), such behaviour is defined as the aggregate tendency towards small foul tactics in a community where the rules defined for a certain society apply. In this article, small foul tactics are defined as conscious minor violations of the rules, which are designed to ensure social norms based on routine, daily relationships that cannot involve excessive punishment at least of a formal nature.

Thus, if institutions play a crucial role in economic development, the propensity for small scale tactics is equally important. Testing the fairness of this hypothesis seems to be quite a challenge.

The propensity for small foul tactics can be seen as a form of opportunistic behaviour. Many articles have been devoted to the study of the various manifestations of opportunistic behaviour. Liolion and others (Lioliou et al., 2019) consider opportunistic behaviour in the financial services sector in their work. Ouardighi and Shniderman (Ouardighi and Shniderman, 2019)discusses opportunistic behaviour in contractual relationships between providers and recipients of services and goods.

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Obviously, empirical testing of the hypothesis of the impact of the society's aggregate propensity for small-focus tactics on economic performance is a difficult task as it is difficult to imagine how this propensity can be “measured”. To solve this problem, it is necessary to investigate some supporting variables that somehow characterise the propensity for small scale tactics. Such variables are sometimes called proxy variables.

In the present work, it is proposed to use the indicators of road traffic violations in different countries as proxy variables that characterise people's propensity for small foul tactics. It is clear that it is impossible to place a traffic police inspector next to every driver, moreover, CCTV cameras cannot record all violations and therefore there is always room for minor violations. The number of such violations will be smaller the less the society's overall propensity to engage in small-foul tactics. Road traffic violations lead to undesirable consequences. Often these consequences are tragic. In many countries, the consequences of traffic violations are carefully recorded and fairly accurate statistics on violations are kept. If we agree with the assumption that road traffic accidents are often also a consequence of a propensity to engage in low level tactics, then the aforementioned statistics can be used to test our basic hypothesis.

2. Literature review

In recent years, many studies have been conducted on the impact of institutions on the economic development of countries. In a work Konstantinos and others (Alexiou et al., 2020) it was examined the impact of institutional development indicators on economic growth on a sample of 27 post-socialist countries. It was shown that in the long term, most institutional development indicators have a positive correlation with economic growth. Obviously, institutional development has an impact on economic growth not only directly but also in combination with other aspects of social development. Thus, the work of Zergawu and others (Zergawu et al., 2020) examines the impact of institutions on economic growth in conjunction with infrastructure development. It has been shown that the variable characterising the combined impact of institutions and infrastructures on economic growth is significant. In Aluco and Ibargim's article (Aluko and Ibrahim, 2020) the interaction between institutions and the development of countries' financial sectors is explored, while in Perry's (2020), Jie’s and Xuan's work (2020) the institutional development and welfare of countries in the context of the introduction and development of innovative technologies is examined.

The impact of behavioural and cultural characteristics on the institutional and economic development of countries has been thoroughly studied in the works of Tabellini (Tabellini, 2008a, 2008b, 2010). Analysis of data from European countries shows that cultural property has an impact on economic development. In these works cultural values are "measured" based on the individual preferences and beliefs of respondents from different countries. Such notions as trust, respect for other members of society and firm convictions have a positive impact on economic development. These works show that the historical characteristics of European regions have an impact on the formation of the above mentioned notions and, consequently, on economic development. These works by Tabellini have shown the

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importance of cultural and behavioural aspects to economic relationships and have stimulated further research. For example, in the article of Gorodnichenko and Roland (2020)the influence of cultural values, in particular the propensity for individualistic and collective forms of behaviour, on the formation of institutions and democracy is examined. It has been shown that societies with greater inclination to individualistic forms of behaviour can build democratic institutions much faster and more effectively. The issues of corporate reputation and culture in different countries in the context of institutional development are discussed in the work of Deephouseet al (2016). It has been shown that commitment to building corporate reputation is negatively correlated with the development of formal institutions.

When analysing traffic accidents, researchers often turn to the question of the institutions' impact on the number of accident victims. In the work of Albalata and Yarygina (2017), a high number of traffic accidents are noted in the list of reasons for the deaths of citizens from different countries. The authors conclude that one of the main causes is the low institutional development of countries. In the article of Bertoli and Grembi (2018)it is noted that the number of traffic accidents depends on political cycles. In particular, the number of injuries due to road traffic accidents is increasing in the municipal election year. The authors obtained these results by studying traffic accident statistics in Italy.

One of the most important consequences of institutional development is the quality of road infrastructure. A study of the impact of road infrastructure on the number of accidents and fatalities leads to contradictory results. For example, Anastasopoulos et al (2008), Flahaut (2004), Park et al (2012), Haynes et al (2008) note the positive impact of the quality of road infrastructure on traffic accidents. At the same time, Noland's (2003) studies did not find any significant correlation between these phenomena. In our opinion, these contradictions are due to the lack of analysis of the behavioural conditions of road users. As early as 1975, Peltzman (1975)noted the very important behavioural aspect of improving road transport infrastructure. According to Peltzman, drivers are prone to more risky behaviour in the event of improved road transport infrastructure, and this can lead to more accidents on the roads, even with a high level of traffic organisation. All of these studies show that road transport statistics provide information on both the institutional development of countries and the behavioural prerequisites adopted in one country or another.

3. Methodology

3.1. Data

The statistics of the Organisation for Security and Cooperation in Europe (OSCE) are used in the present work. There are two indicators that can be used as proxy variables, including the impact of aggregate behavioural trends in a country. They are the number of deaths and the number of injuries due to traffic accidents. A small analysis of how to record the number of fatalities and injuries in different countries as a result of traffic accidents suggests that the number of fatalities is a much more reliable indicator, as its calculation is more understandable and leaves less room for different interpretations, while the number of fatalities can be interpreted differently in different countries and situations. In addition, the

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number of deaths is much harder to conceal than the number of injuries. Based on these considerations, the death toll indicator for 2017 is used for the analysis.

The OSCE statistics contain a sample of 50 countries. The average values and standard deviations of the variables are shown in Table 1. In addition to OSCE data, World Bank data on institutional development and welfare of countries is also used in the work.

Table 1: Indicators used in the calculations

Indicators	**Mean**	**St. Dev.**	**Symbols**
Government Effectiveness	0.90	0.79	GE
Regulatory Quality[1]	0.92	0.75	RQ
Rule of Law[1]	0.85	0.93	RL
GDP per capita ($)[1]	28,051.66	23,102.87	GDP.P.C
Road fatalities	5,293.02	21,152.59	R.FAT
Total inland freight transport (Mln. Tons per km.)[2]	406,119.81	1,269,743.73	TIFT
Road passenger transport (Mln. Passengers-km.)[2]	656,562.07	2,420,955.85	RPT

Source:1) the World Bank, https://data.worldbank.org/; 2) OECD.Stat,https://stats.oecd.org/

The number of fatalities per million inhabitants is often used to analyse traffic accidents in different countries. However, in order to obtain an objective picture of traffic accidents, the intensity of traffic in different countries must also be taken into account. For this purpose, the freight and passenger traffic intensity indicator is used. As traffic volumes may vary from country to country due to cargo and passenger traffic, the traffic intensity indicator calculated as a simple arithmetic average of the cargo and passenger traffic intensity indicators is used in the work. Then the number of deaths per unit of the traffic intensity indicator is calculated.It should be noted that the passenger transportation indicator to some extent carries information about the population of a country. Therefore, the traffic intensity indicator that we use is much more informative than using the number of people living in one or another country.

3.2. Traffic accidents and institutional development

Traffic accidents are not only the result of aggregate behavioural factors, but also of the level of institutional development in the country, in particular the level of institutional regulation and control of road traffic. Thus, it can be assumed that the higher the number of traffic accidents, the lower the welfare in the country should be, as traffic accidents carry information about the institutions and behavioural prerequisites. However, in order to check our basic hypothesis about the impact of aggregate behavioural assumptions on a country's welfare, it is necessary to compare this impact with the direct impact of institutional development indicators on a country's welfare. If it turns out that in the study of the impact of road traffic accidents on the welfare of the country, in addition to the impact of institutions, there is still some significant component, then it can be interpreted as a component of cumulative behavioral prerequisites.

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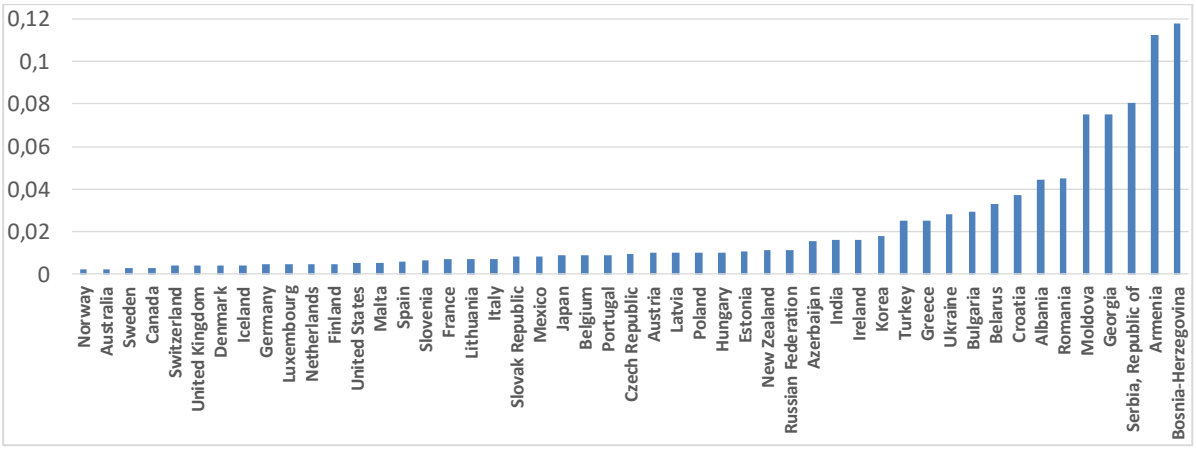
Figure 1shows the ratio of the fatalities' number in traffic accidents to the traffic intensity indicator for all countries in the sample under study.

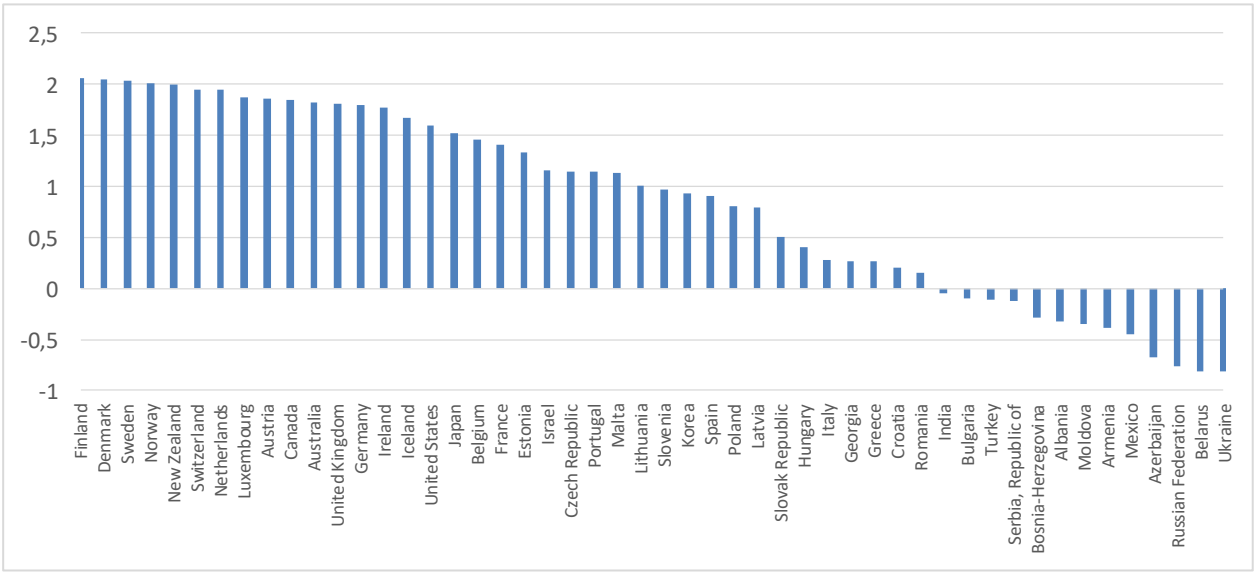
Figure 1: The ratio of fatalities in traffic accidents to the traffic intensity indicator



Source: OECD. Stat,https://stats.oecd.org/ and authors' calculations.

If we compare Figure 1. with Figure 2. which presents "Rule of Law" indicator for the same sample of countries, we find that the order of countries in the figures (they are ordered in ascending and descending order respectively) is quite close. For example, in the list of the first seven countries in Figure 1. and Figure 2. 4 countries are the same. The Rule of Law indicator is one of the countries' institutional development characteristics published in the World Bank's Word Development Indicators. Such a simple visual comparison shows that traffic accident data can actually carry some information about the institutional development of countries.

Figure 2: Rule of Law



Source:the World Bank, https://data.worldbank.org/

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In the World Development Indicators database, there are two other countries' institutional development indicators presented in Table 1. We will not compare these indicators with traffic accident indicators visually, but we will use them in our model, which tests the main hypothesis about the impact of the indicator of aggregate propensity to small violations on the welfare of countries.

3.3. Model description

To test the main hypothesis, we use the Structural Equation Models with Mediation (Hayes, 2013). To define the model, we will use the notations of variables given in Table 1. First of all, we will define the traffic intensity indicator:

$$TII = \frac{TIFT + RPT}{2} \qquad (1)$$

Based on TII indicator, we will also define the variable "number of fatalities in traffic accidents per unit of the traffic intensity indicator":

$$RF.TII = \frac{RF}{TII} \qquad (2)$$

RF.TII is the number of fatalities in traffic accidents per unit of the traffic intensity indicator.

In the structural equation model, we will also generate an INST variable characterising the development of institutions in one or another country based on three variables describing different aspects of institutional development: Rule of Law, Government Effectiveness and Regulatory Quality. For this purpose, the structural equation model uses factor analysis methods. The variable generated in this way will be used as an exogenous variable and RT.TII as a mediation variable.

The investigated model will have the following form:

$$gdp.p.c = i_1 + c * INST + \varepsilon_1 \qquad (3)$$

$$RF.TII = i_2 + a * INST + \varepsilon_2 \qquad (4)$$

$$gdp.p.c = i_3 + c' * INST + b * RT.TII + \varepsilon_3 (5),$$

where **c** is a parameter showing the full impact (including behavioural aspects) of institutions on welfare, **a** is a parameter showing the impact of institutions on the level of fatalities in traffic accidents, **c'** is a parameter showing the direct impact of institutions (without behavioural effects) on welfare, and finally **b** is a parameter showing the impact of the RG.TII media variable on GDP.P.C. variable. are free members in the respective regressions (3), (4) and (5) respectively, represent random errors in regression (3), (4) and (5) respectively. In the model we use the variable gdp.p.c, which is the logarithm of the variable GDP.P.C. This

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transformation of the variable ensures the normal distribution of errors in regressions from (3) to (5).

4. Results

To evaluate the model described in equations (3) - (5) we use the lavaan package of the R programme. A detailed description of designations, evaluation methods and presentation of results can be found in the book of Gana and Broc (2019). We use standard designations from this book to describe the coefficients. The results of the model evaluation are presented below. Figure 3 presents the same model schematically in lavaan format.

Model Test User Model:

Test statistic	24.342
Degrees of freedom	4
P-value (Chi-square)	0.000

Latent Variables:

		Estimate	Std.Err	z-value	P(>|z|)
INST =~					
GE		1.000			
RL		1.167	0.052	22.576	0.000
RQ		0.911	0.053	17.294	0.000

Regressions:

		Estimate	Std.Err	z-value	P(>|z|)
gdp.p.c ~					
INST	(c)	1.053	0.103	10.188	0.000
RF.TII ~					
INST	(a)	-0.020	0.004	-5.047	0.000
gdp.p.c ~					
RF.TII	(b)	-7.474	2.812	-2.658	0.008

Defined Parameters:

	Estimate	Std.Err	z-value	P(>|z|)
ab	0.153	0.064	2.379	0.017
total	1.206	0.093	12.968	0.000

It can be seen from the above results that all the coefficients in equations (3) - (5) are significant. On the basis of three variables characterizing various aspects of institutional development, a latent variable INST was generated that characterizes institutions. It is noteworthy that all the variables participating in the formation of the latent variable are also

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statistically significant.

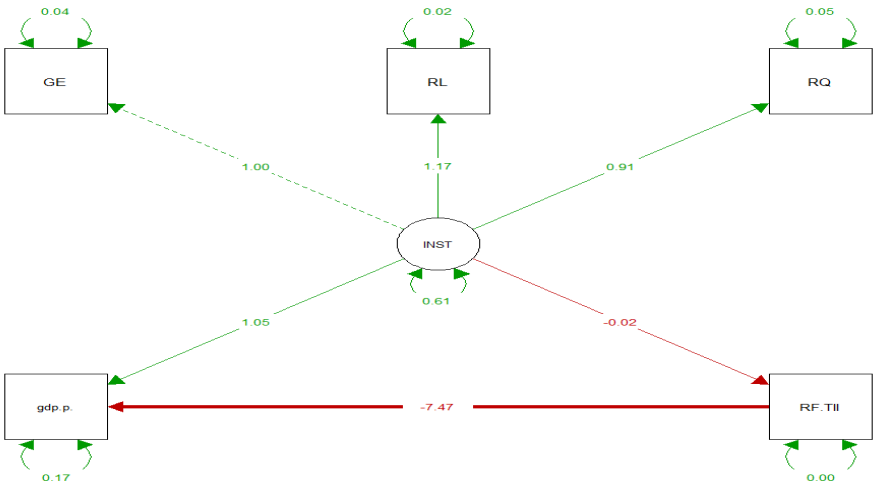
It should also be noted the significance of the chi-square test, which indicates that a model with a mediating variable is generally more adequate model than a model of simple institutional impact on the countries' welfare.

5. Discussion

It is very important that all parameter signs obtained from the model evaluation coincide with their theoretical values. The impact of institutions on the welfare of countries is positive, i.e. the higher the indicator of institutional development, the higher the welfare of countries, according to the Nord. At the same time, the higher the level of institutional development, the lower the level of fatalities in traffic accidents. In turn, the high level of road traffic accidents indicates that the welfare of countries is low. However, the most important indicator is the product of coefficients *a* and *b* from equation (4) and (5) respectively. It is the statistical significance of this parameter that shows the significant impact of aggregate behavioural prerequisites on the countries' welfare. As can be seen from the results, this coefficient is also significant and is interpreted in the model as an indirect impact of institutions (through the rate of fatalities in traffic accidents) on the countries' welfare.

As we have already mentioned, the fatality rate in traffic accidents carries information about both the institutions and the total propensity for small foul, and therefore the indirect or residual impact described by *a*b* coefficient can be interpreted as the impact of the total propensity for small foul on the countries' welfare. This impact is statistically significant and according to the model represents approximately 13% of the total impact of institutions on the countries' welfare.Thus, the main hypothesis tested in the present work has been fully confirmed. Behavioural prerequisites , along with institutions, have an impact on the countries' welfare.

Figure 3: Schematic representation of the structural equation model



Source: authors' calculations

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5. Conclusions

The conducted empirical analysis shows that institutions affect the countries' welfare not only directly, but also through their impact on the behavioural characteristics and prerequisites historically established in different countries. Even the strongest and most organized institutions leave a chance for minor violations. In such situations, the combined propensity for small-scale tactics and the ability of existing institutions, both formal and informal, to influence this propensity comes to the fore.

An analysis of traffic accident rates, which provides information on the aggregate propensity for small-fault tactics and the sophistication of institutions, shows that the full impact of institutions on the countries' welfare contains two components such as the net impact of institutions, and the component that is determined by the variable fatality rate in traffic accidents. Moreover, both of these components are significant. Thus, if the idea that traffic accident rates contain information on the propensity for small scale tactics is correct, then this propensity has a statistically significant impact on countries' welfare.

The obtained result is important because it shows that the development and strengthening of institutions has to be combined with the overall behavioural requirements of society, take into account their specific characteristics and aim, among other things, to change these requirements. The aggregate behavioural prerequisites are important for economic development. Any methods that can influence these prerequisites can be very helpful in implementing a successful economic policy.

Conflict of Interest

This research holds no conflict of interest.

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