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THE IMPACT OF THE COMPETITION POLICY ON ECONOMIC DEVELOPMENT IN THE CASE OF DEVELOPING COUNTRIES

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In this paper, we will analyse the impact of the effective application of the competition policy to the economic development of developing countries. Many empirical papers suggest that the existence of the competition policy does not significantly affect the level of the GDP *per capita,* and that only its effective application is important. We will take the same approach and use the World Economic Forum index as a proxy for the effective application of the competition policy. We will demonstrate that a part of the variations in the GDP *per capita* between developing countries could be explained by an effective application of the competition policy.

Ključne reči: competition policy, intensity of competition, economic development, developing countries

JEL Classification: L51, O12

INTRODUCTION

The objective of this research is to examine the impact the competition policy has on the economic development of developing countries. Although this policy has been in existence in the world for more than a century, in some countries it does not have a long history of application. Its main function is to contribute to an increase in welfare and to increase the efficiency and productivity of the entire economy. Most countries intend to formulate a sustainable growth strategy that will provide a better standard of living. Such circumstances have led to a change in the paradigm of economic development, so that developing countries are increasingly shifting to solving internal problems, as their impact at the global level is limited.

One of the basic internal problems of developing countries is certainly solving the issue of the competition protection policy. The adoption of a regulatory framework and the establishment of a regulatory agency in this area are also conditions for admission to the full membership in the European Union. There is extensive literature on the competition policy, and within it, there are the theoretically founded claims that the implementation of such a

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policy contributes to the economic progress and well-being of the entire society. The question imposing itself is whether this is achieved in practice, and above all whether this applies to developing countries.

The objective of this paper is directed towards testing the following hypothesis:

H: The effective enforcement of the competition policy has a positive impact on the economic development of developing countries.

To test this hypothesis, the indicators of the effective application of the competition and economic development policy will be formulated.

This research study is aimed at demonstrating the fact that there is a positive impact of an effectively guided competition policy on the economic development of developing countries. In addition, its objective is also to contribute to understanding the importance that the competition policy has within the regulatory framework of a country's economy. If the accuracy of the hypothesis is confirmed, developing countries should pay greater attention to the development and implementation of the competition policy due to the processes and changes occurring in their markets. The competition policy directly influences the decisions made by individual economic entities. In this way, it also has an indirect impact on consumers, on the one hand, and the whole economy, on the other.

The rest of the paper is organized as follows; in the second part, a brief overview of the literature that examines the impact of the competition policy on economic development is presented. In the third part, the methodology for selecting a sample of countries for the purpose of conducting our empirical analysis is explained. In the fourth part, an explanation for the selection of the independent variables is given, and their behavior in developing countries is analyzed. In the main part of the paper, the hypothesis that there is a positive impact of the effective application of the competition policy on the economic development of developing countries is tested. The last part of the paper is reserved for the conclusion.

LITERATURE REVIEW

According to the convergence hypothesis, developing countries should have a higher rate of economic growth than developed countries. However, the continuation of sustainable economic development and the convergence of developing countries were undermined during the global economic crisis. In such an environment of slow economic progress at a global level, developing countries should pay more attention to the internal issues that could contribute to their economic growth.

Competition encourages market participants to be more efficient and to offer a greater choice of products and services at lower prices. At the same time, competition increases economic efficiency, through a reduction in production costs, technological progress and innovation. Even though the protection of competition may increase welfare due to the previously mentioned reasons, the competition policy might often be in conflict with other policy objectives.

In the past, most jurisdictions had no clearly defined priorities when shaping the competition policy and setting its objectives. In the period of the Great Depression, in order to mitigate the consequences of a worldwide economic downturn for the economy, the US were benevolent to certain forms of agreements between companies, even though these agreements represented the most severe violation of competition, such as price fixing. For similar reasons, the European Commission tolerated the so-called "crisis cartels" at specific moments.

While the historical evidence undoubtedly shows that market forces, when left to themselves, do not always produce the best results in terms of market structures, the view that economic efficiency should be the core function of the competition policy prevails in modern industrial organization. Economic efficiency has often been viewed and assessed in terms of the three mutually compatible concepts of efficiency - allocative, productive and dynamic - in relation to which the objectives and effects of the competition policy are observed.

In a situation when the existence of the market power enables a monopolist to set prices above marginal costs, the loss of social welfare stems from allocative inefficiency. The monopolist becomes productively inefficient as well, since a lack of competitive pressure minimizes incentives to lower operational costs, and a higher cost is fully shifted forwards to consumers in the form of increased prices. The managements of these companies are not motivated to improve their business and production processes. (Liebenstein, 1966). Productive efficiency is also discussed in M. Motta (2002), who examines the two main arguments which suggest that a monopolistic firm is likely to be productively inefficient. The first argument is based on the so-called principal-agent models and empirical evidence of individual firms' productivity, presented by S. J. Nickell (1996) and K. M. Schmidt's (1997). The second is the so-called "Darwinian" argument, according to which competition increases industrial productivity by enabling the survival of the most efficient firms. The empirical evidence for this argument was found in G. S. Olley and A. Pakes (1996), who study the impact of technological change and gradual liberalization in the telecommunications equipment industry in the US on aggregate productivity, and in R. Disney, J. Haskel and Y. Heden (2000), who analyze the relative importance of external restructuring in the entry-and-exit form in explaining productivity growth.

Unlike the two static concepts of efficiency, whose main focus is on the existing production capacities, the third concept of efficiency refers to the ability of market participants to invest in new technologies. Under normal circumstances, competition forces businesses to innovate their production processes, introduce new technology and new products so as to improve their competitiveness. However, if research and development costs are high, as in the pharmaceutical industry, possessing a certain market power might have a positive effect on innovation. This "trade-off" between competition and innovation has been captured by a number of theoretical models. .

Market competition fosters the entrepreneurial initiative by creating incentives to innovate and, in the long-term, promotes economic efficiency, technological progress and economic growth and development. In the past, a number of countries, particularly developing ones, held the view that competition leads to the excess capacity and diseconomies of scale, and most of them lived in the fear of weakening the position of national champions in global trade. The main idea for this type of the industrial policy, as explained in M. Richardson and S. Knowles (1999), is that by limiting the number of firms in the market, the government can more easily implement some policy objectives, such as an increase in the share of tradable goods in industrial production. Simultaneously, a high concentration enables firms to obtain a high profit, and in this way the government provides high incentives to firms so as to pursue its industrial policy objectives. Therefore, M. Richardson and S. Knowles (1999) conclude that a combination of the competition policy and the industrial policy that controls a number of firms in the market was pursued by some developing countries. According to A. Amsden and A. Singh (1994) and A. Singh (2002) these countries were searching for the optimal level of competition in order to promote dynamic efficiency.

The illustration of the previous approach could be found in Japan's competition policy between 1950 and 1973, when Japan was in the position of a developing country according to A. Singh and R. Dhumale (2001). In that period, the industrial policy was more important for than government than the competition policy, and mergers between large firms in some strategic industries were encouraged by the idea that high savings and investment rates could only be achieved by big companies. A. Amsden and A. Singh (1994) explain that the optimal mix of competition and cooperation depended on the phase an industry found itself in. In young industries, competition was suppressed; in the phase of technological maturity, competition was encouraged, whereas in the declining phase, it was discouraged again. This policy brought about the high rates of economic growth and the paradoxical result was that even though the industrial policy dominated, the level of concentration in the industry declined due to the entry and larger production of small companies. In this case, economic growth reduced concentration.

The same policy was applied in South Korea and also resulted in high growth rates. B. Song (1994) claims that the share of the 3 biggest firms in industrial production in South Korea was 62%, whereas the same measure for the US economy was 3 times lower. However, economic growth did not result in a decline in concentration since growth was mainly governed by the higher production of big firms.

Such concerns have faded away over the last decades as economies have become aware of the fact that exposure to competition is the best way to strengthen the capacity of individual business entities and the entire industries in order to successfully compete in the international market.

The stagnation of the Japanese economy since 1994 has revealed that, after the first stage of development, the industrial policy must be subordinated to the competition policy. This is the line of the reasoning of D. Açemoglu, P. Aghion and F. Zilibotti (2003), who claim that high saving rates and factor accumulation are important for less and mid-developed countries, in which limited competition can be beneficial for their economic growth. When a country becomes developed, however, the growth potential of factor accumulation diminishes. In that stage, the economy is based on knowledge and sophisticated innovations require more competition.

In some developing countries, high concentration is a consequence of the dominant position of state-owned enterprises, rent seeking behavior by private companies, and high barriers to entry (Parker & Kirkpatrick, 2004). High concentration also provides high incentives to collude. Collusion may also include local authorities and the companies with the dominant position in the local market in the form of administratively imposed barriers to entry. In this case, high concentration represents an obstacle for economic development.

The rest of the paper is organized as follows: in the second part, a brief review of the theoretical and empirical papers that deal with the impact of the competition policy on economic development is provided. In the third part, the methodology for choosing the sample of the countries for our empirical analysis is explained. In the fourth part, an explanation for the choice of the independent variables and their behavior in developing countries is explained. In the main part of the paper, the hypothesis that there is a positive impact of the effective application of the competition policy on the economic development of developing countries is tested. The ultimate part of the paper is reserved for the concluding remarks.

The theoretical literature that deals with the impact of the competition policy on economic growth suggests that competition can boost or dampen economic growth, whereas the empirical literature mainly finds a positive influence of competition on economic growth. In the theoretical literature, the impact of the competition policy is measured through its impact on innovation, whereas innovation, on the other hand, is the most important factor of economic growth.

The negative effect of competition on innovation is described in P. Aghion and R. Griffith (2008) in Hoteling's model, where a higher level of competition is represented by a reduced transport cost. Higher competition reduces a firm's profit and incentive to innovate. The same conclusion is obtained in the Dixit-Stiglitz monopolistic competition model, where higher-level competition is represented as a higher substitutability between products. Yet another possibility is presented in the Schumpeterian quality-ladder model of P. Aghion and P. Howitt (1998), where property rights protection is beneficial for economic growth, and higher-level competition adversely affects economic growth through the innovator's lower profit.

According to P. Aghion and R. Griffith (2008), the positive effect of competition on innovation is explained by the rent dissipation effect in a market with a monopolist and a potential entrant. An incumbent can deter entry and retain a monopoly profit by investing in innovation. Otherwise, he has a duopoly profit. On the other hand, the entrant's profit is 0 if he stays out of the market, and he obtains a duopoly profit if he enters. Rent dissipation exists if the difference between the monopoly and duopoly profits is greater than the duopoly profit, which means that the incumbent is more motivated to innovate than the

entrant is. An alternative explanation is provided in the model of vertical differentiation, where firms have different costs. Low-cost firms have a higher market share and this will motivate the entry of new low-cost firms. Moreover, bigger competition will induce high-cost firms to innovate the production process in order to become low-cost firms.

There are some methodological problems identified by P. Aghion and R. Griffith (2008) in the relationship between a firm's size and innovation. The first issue is that a firm's size is correlated with its age, and that older firms possibly innovate more. The second issue is a reverse causality, meaning that the firms which innovate gain a market share, and a firm's size is a consequence of its innovative efforts. The last aspect implies that even if larger firms innovate more, there are fewer firms in the market and the effect on aggregate innovation is ambiguous.

An interesting approach in which the intensity of competition and innovation are mediated by asymmetric information is provided by P. Aghion, M. Dewatripont and P. Rey (1999). They assume that firms can have two possible forms of behavior: profit maximizing and conservative behavior. Under the profit maximizing assumption, competition reduces benefits from R&D for an individual firm and the overall amount of research in the industry. Therefore, under this assumption, higher-level competition reduces the endogenous growth rate. Under the assumption of conservative behavior, firms have the private costs of introducing innovation and their motivation is to delay the introduction of new technology until the very last moment before the old technology has become useless. Higher-level competition reduces the lifecycle of technologies, which means that firms will introduce new technologies earlier, in which case higher-level competition leads to a higher endogenous rate of economic growth. Firms' behavior can be made endogenous in the model when it is related to the size of agency problems between their managers and their owners. If agency problems are at a low level, firms maximize their profits, whereas if agency problems are at a high-level, firms adopt conservative behavior. This perspective offers an important recommendation for developing economies where agency problems are at a higher-level than in developed economies. In this case, higher-level competition is beneficial for economic growth.

Concerning the empirical relationship between competition and innovation, S. J. Nickell (1996) measures innovation with the total factor productivity (TFP) and finds that the growth rate of the TFP is higher in more competitive industries. The same conclusion is drawn by R. Blundell, R. Griffith and J. Van Reenen (1999), who find a higher rate of innovation in more competitive industries. By using microdata, G. R. Clarke (2011) finds that the countries with stricter competition laws have more innovations, whereas a higher-level price competition between firms reduces innovations.

The impact of the competition policy on economic development is discussed by P. Rey (1997). In developing countries, market concentration is high in some industries with high barriers to entry, implying that an appropriate merger control and an anti-collusion policy are the important elements of economic development. The underlying assumption is that high concentration does not increase dynamic efficiency.

The second aspect is related to predatory behavior, when a dominant firm in the market can initiate a price war and reduce a small firm's cash flow and increase the interest rate for a small firm's new credits. Due to the fact that financing opportunities are scarcer in developing countries and the information asymmetry is higher in the credit market, predatory behavior is a more important issue in developing than in developed countries. Therefore, the competition policy that prevents predatory behavior is beneficial for economic development.

In the empirical literature related to the impact of the competition policy on economic development, the choice of the variable that measures the competition policy and its effectiveness is the key issue. One possible measure is the Antitrust Law Index (ALI) that consists of several sub-indices. The first considers the sanctions that the competition authorities may impose, such as fines or imprisonment. The second

relates to the merger policy. The third dimension covers collusive agreements, whereas the last one covers the restrictions of trade.

In the literature, there are also alternative approaches to the measuring of the existence of the competition policy. The first is the binary approach that uses a variable with the value 1 if a certain competition law is adopted, and the value 0 in other cases. The second approach suggests that input measures, such as the budget of the competition commission, or output variables, such as the number of the investigated cases or the number of appeals in the court against the competition commission's decisions, should be used. In order to control the size of the economy, the commission's budget should be calculated per staff or as a share of the GDP.

M. W. Nicholson (2008) shows that the Antitrust Law Index (ALI) is not an appropriate measure of the effectiveness of the policy. The variable that captures the effectiveness of the policy application is published by the World Economic Forum (WEF) and is calculated based on business leaders' opinions about the effectiveness of the competition policy. The paradox identified by M. W. Nicholson (2008) is that the ALI is the highest for transitional economies, but in these countries the laws are not accompanied by an effective application. This claim is supported by the fact that the correlation between the WEF index and the ALI is -0,198 indicating that the countries that have formally stricter laws have a less effective application in practice.

The impact of the competition policy on economic development can be assessed in a three-stage procedure, the idea of which came from M. Krakowski (2005). In the first stage, the effective application of the competition policy based on the WEF survey is the dependent variable, whereas the independent variables are the existence of the competition policy, the experience of the competition commission and the government's effectiveness in the general policy application. The results reveal that the variables for the competition commission's experience and the government's experience in the general policy application are significant. In the second stage, the intensity of competition based on the WEF survey is the dependent variable. Concerning the independent variables, the results reveal that the effectiveness of the competition policy and the GNP are significant, whereas the variables of external protection (tariffs, quotas and non-tariff barriers) are not significant. In the last stage, the GNP *per capita* is the dependent variable, while the intensity of competition is the independent variable. The results show that the economies with a higher level of competition have a higher level of economic development.

The empirical analysis of the implementation of the competition policy in transition economies is studied by M. A. Dutz and M. Vagliasindi (2000). They measure the implementation of the competition policy by applying three dimensions: enforcement, competition advocacy and institutional effectiveness.

Enforcement measures the effective application of the competition policy against firms. It consists of sub-dimensions, such as the abuse of the dominant position, cartels and mergers. Competition advocacy concerns a large set of the different economic policies that interact with the competition policy.

Institutional effectiveness is measured by the independence and transparency of the competition commission. The sample includes 26 transitional countries in Central and Eastern Europe, as well as some post-Soviet countries. The descriptive statistics reveal that the countries that have first adopted a competition policy, namely the Baltic States and Romania, lead in the implementation of the competition policy. Regression suggests that law enforcement and institutional effectiveness have a significant impact on the intensity of competition, whereas the impact of competition advocacy is not significant.

The paper that analyzes the impact of the competition policy on the GDP growth in developing and developed countries in the Solow growth model framework is T. C. Ma's (2011). The presence and scope of the competition policy is captured by the SCOPE variable that is defined in the paper by K. N. Hylton and F. Deng (2007). The overall effectiveness of the government's application of policies, not only of the competition policy, is captured by the

EFFICIENCY variable that is defined in the paper by D. Kaufmann, A. Kraay and M. Mastruzzi (2009). The results show that the SCOPE variable is not significant and the formal existence of the competition law cannot influence economic growth. The interacting variable of SCOPE x EFFICIENCY is named EFFLAW. For poor countries, the coefficient for this variable is 0.04 and is significant, whereas for rich countries the coefficient is 0.064 and is also significant. Therefore, the competition law must be complemented with the effective enforcement of this policy.

SAMPLING METHODOLOGY

The term "developing country" is commonly used to indicate the country that has a relatively low living standard, the underdeveloped industry and a lower level of the overall wellbeing relative to more (economically) developed countries. Various institutions use different thresholds of material and non-material wealth to classify individual jurisdictions in certain categories of development, and it is extremely difficult to accurately answer the question of how much a country should (or should not) be "rich" to be considered as a developing country. Even among developing countries, one might encounter evident differences in the level of economic and social development. These issues have brought about a widespread debate on the use of the term developing country in recent years, and have ultimately encouraged international organizations to soften their approaches or even cease to distinguish between "developed" and "developing" countries in the presentation of their data.

The GDP or income *per capita* is usually considered as the initial criterion for classifying countries in the different stages of development. For both operational and analytical purposes, the World Bank classifies countries according to their gross national income *per capita* into four income groups: low income countries, lower and upper middle income countries and high income countries. Other institutions use slightly different classification schemes. The International Monetary Fund, for example, applies a flexible classification system by taking into account *per capita* income, the diversification of exports and the degree of integration into the global financial system. According to these three criteria, countries are classified into advanced economies, on the one hand, and emerging market and developing economies, on the other.

Until 2004, the IMF had clustered all the Central and Eastern European countries, including the former Soviet Union countries in Central Asia and Mongolia, into countries in transition, whereas today, they all belong to developing countries. The UNDP broadly classifies all countries into three categories: developed economies, economies in transition and developing countries. Certain economies within developing and transition countries are further classified as fuel-exporting countries, whereas a fair percentage of developing countries fit into the group of the least developed countries. Developing countries are also divided into landlocked and small island developing countries.

When deciding upon which countries to include in our sample, we commenced with the WB List of Economies from December 2016. Initially, we included all of the lower and upper middle income countries, namely 70 of them in total. In order to avoid extreme discrepancies in terms of income, we decided to exclude low-income countries from our analysis, despite the fact that until recently they have also been considered as developing countries. Further research showed that 60 out of the 70 initially considered countries had competition legislation in force, so the final sample was composed of 60 countries. This is a considerable improvement compared to 1990, when only 16 developing countries had a formal competition policy according to A. Singh (2002), and were assisted by the WTO and other international institutions to adopt competition laws in the period that followed.

Although the countries in the sample constitute a heterogeneous group, the results of the research will be of great importance since the testing of the initial hypothesis will provide an answer to the importance of the effective implementation of the competition policy for economic development.

INDICATORS OF THE EFFECTIVE APPLICATION OF THE COMPETITION POLICY AND ECONOMIC DEVELOPMENT

Before testing the initial hypothesis set in this research study, we analyzed the individual indicators that would be used as the variables in the regression model. As the indicator of the effective application of the competition policy, we used the country scores provided by the World Economic Forum (WEF, 2016). Since its establishment, the WEF has created a number of indices to measure and compare the competitiveness of national economies. The indicator that has been in use since 2005 is called the Global Competitiveness Index (GCI), and it assumes that, in today's globalized economy, there are a number of the factors that explain the competitiveness of national economies. Another important feature of the GCI is that all the factors of competitiveness are grouped into 12 categories, i.e. the 12 pillars of competitiveness.

In order to create a global competitiveness index, the WEF uses a total of 114 competitiveness factors. The data used in the research study were obtained in two ways: by the direct measurement (the quantifiable data), obtained from the relevant statistics and international institutions, and the executive opinion surveys, where data are obtained by interviewing the representatives of the business community. The WEF includes the majority of the factors that are key to economic growth and development: institutions, macroeconomic factors, the infrastructure, education, technology and so on. Every year, the WEF conducts a survey which covers a significant number of countries. Respondents are business leaders who evaluate the effectiveness of the competition policy in their country. The effectiveness of the competition policy of each country is given a score, ranging from 1 to 7. The score 1 means that the competition policy is weak and ineffective, while the score 7 means that there is an effective protection of competition in that country. One of the shortcomings of the GCI, as well as of the individual factors, is the fact that the indices mostly rely on the data obtained from different surveys, which, to some extent, makes the obtained estimates biased and may affect the research outcome. However, for the purpose of this study, the data to be used can be considered as relevant.

The first variable that we present is the average GDP *per capita*, which is the dependent variable in our regression, the indicator in our analysis being the GDP *per capita*. The GDP *per capita* is used as an indicator of the economic development of the observed countries in order to test the hypothesis. The GPD *per capita* for the year 2015 for the observed countries is shown in Figure 1.

The average *GDP per capita* for the observed countries amounts to about 5000 USD. Argentina, Panama and Costa Rica feature the very high levels of the GDP *per capita* compared to the remaining sample. We will neutralize the negative impact of these extreme values on the estimated regression model by introducing a dummy variable. Such a high level of the development of Argentina and the other two countries in Central America is explained by A. Saravia, C. Machicado and F. Rioja (2014), who explain it by alleging high productivity in agriculture, which enabled these countries to relatively early commence the process of industrialization.

The comparative analysis of the indicators of the effective implementation of the competition policy is provided in Figure 2.

Figure 2 shows that the average score for the countries in the sample is about 3.5. South Africa is the top-rated country, whereas the worst performing country in terms of the effective application of the competition policy is Venezuela. South Africa adopted its Competition Act in 1999, when it recognized the necessity for a strong competition policy due to the high level of concentration in the South African economy (Roberts, 2004).

In addition to the previously presented independent variables, on which we base the hypothesis testing, we included in our analysis certain other independent variables: the consumer price index, the exports of goods and services (% of the GDP), the population growth, start-up procedures to register a business (the number of days) and the unemployment rate (% of the total workforce). All of the indicators are graphically presented below.

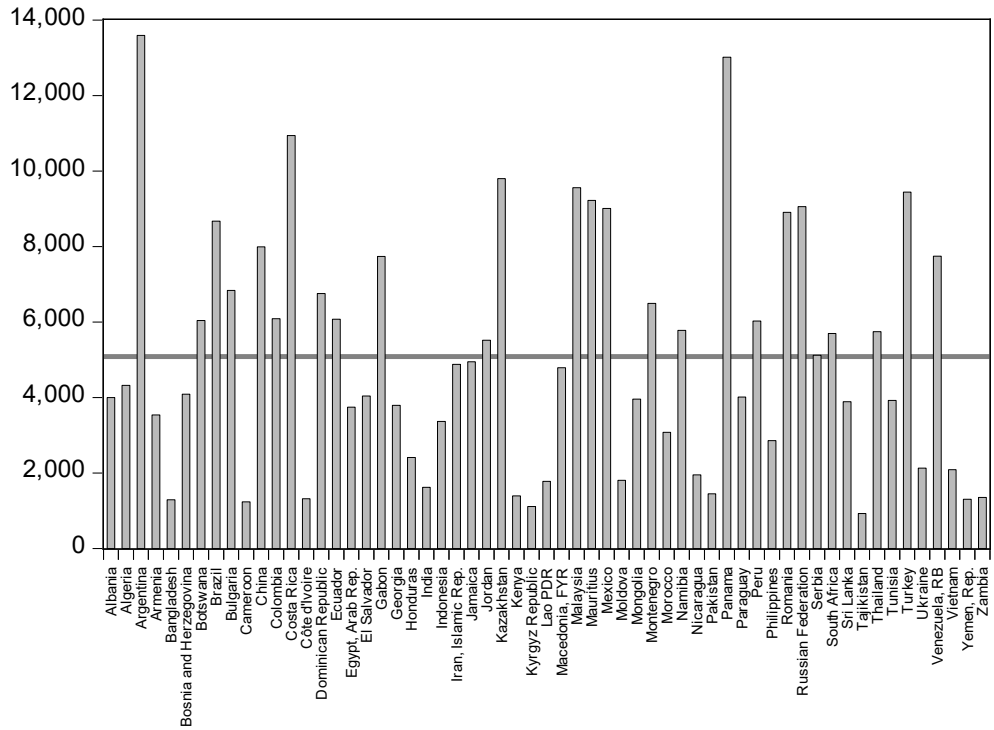

Figure 1 The GDP *per capita* in 2015 (USD)

Source: World Bank

The highest consumer price index, as the proxy of inflation, was observed in the Russian Federation and Iran, whereas Thailand, Jordan and Romania had the lowest (negative) consumer price indices in 2015. The majority of the countries in the sample that have a low level of inflation pursue the policy of inflation targeting (Volz, 2015).

The exports of goods and services of the countries in the sample account for about 35% of the GDP on average. The highest share of exports in the GDP was recorded in Vietnam, above 80%, whereas Yemen, Tajikistan and Pakistan are the least dependent upon exports (around 10% of the GDP).

The next explanatory variable is the population growth rate. The average population growth rate among the selected countries amounts to about 1.2% (Figure 3). The highest rate in 2015 was recorded in Zambia and Kenya, whereas Bulgaria, the Republic of Serbia and Romania, among others, faced negative population growth. The negative growth rate is an obstacle for economic development since the ageing of a population diverts resources from investments in economic development to the healthcare system and pensions (Teixeira, Renuga Nagarajan & Silva, 2016). An interesting analysis of the relationship between pollution, fertility and the GDP *per capita* is provided by D. Varvarigos and I. Z. Zakaria (2017).

The average number of the days needed to start up a business in the selected countries is around 8. The best performing countries in terms of the easiness of registering a business are the FYR of Macedonia and Jamaica, whereas the worst rated are Venezuela and the Philippines.

The highest unemployment rates among the countries in the sample were observed in the FYR of Macedonia, Bosnia and Herzegovina and South Africa (above 20% of the total workforce), whereas on the other hand, Thailand faces the unemployment rate of close to 0 (Figure 4).

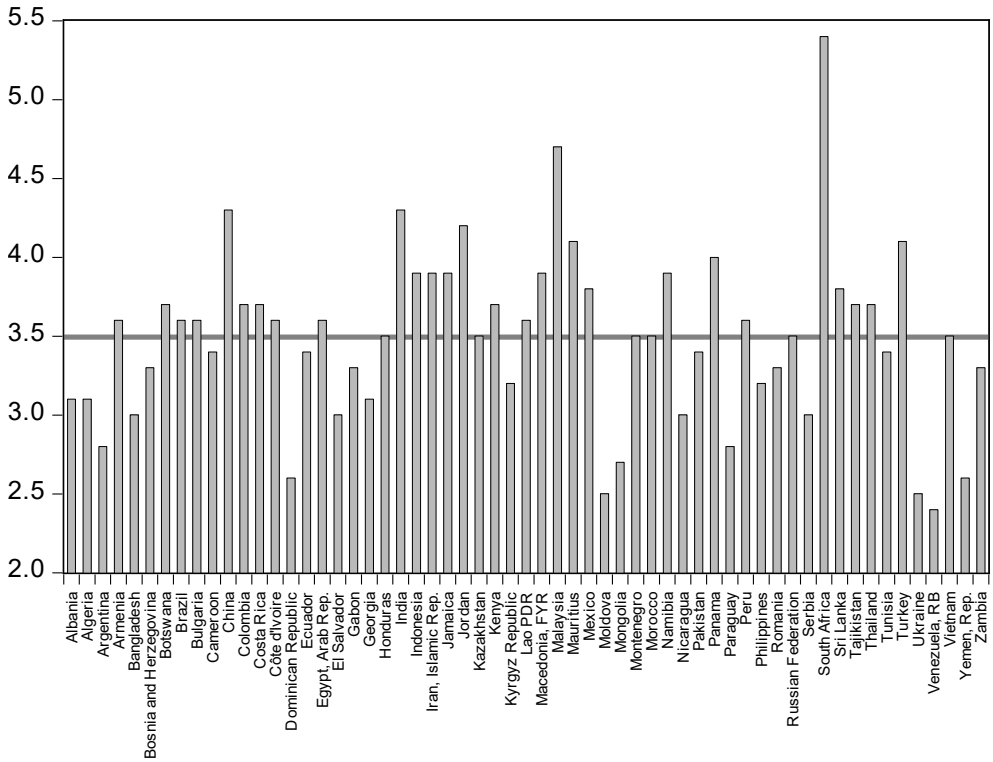

Figure 2 The effective implementation of the competition policy

Source: WEF, 2016

According to H. Feldmann (2008), the unemployment rate in developing economies could be reduced by more cooperative industrial relations that reduce companies' turnover rate and consequently the unemployment rate as well.

THE IMPACT OF THE COMPETITION POLICY ON ECONOMIC DEVELOPMENT

In this part of the research study, the main hypothesis that there is a positive impact of the effective application of the competition policy on the economic development of developing countries will be tested. In order to test the hypothesis, we will use the previously described and analysed indicators. By using the regression analysis, we estimated the linear model of the following form:

$$GDP\_pc = \beta_0 + \beta_1 WEF + \beta_2 CPI + \beta_3 EXP + \beta_4 POPG + \beta_5 STARTUP + \beta_6 UNEMPLOYMENT + \varepsilon \quad (1)$$

where the dependent variable measuring the development level is the GDP *per capita*. The other previously mentioned indicators are used as the independent variables: the WEF (the effective competition policy), the CPI (the inflation rate), the EXP (the share of export in the GDP), STARTUP (the procedures to register a business), and UNEMPLOYMENT (the unemployment rate). In the initial model, the CPI, EXP and STARTUP variables are not statistically significant, and are excluded from a further analysis. The initial model is presented in the appendix.

After the exclusion of the variables that were not significant, we estimated the reduced form of the model. In the second regression, we added a dummy

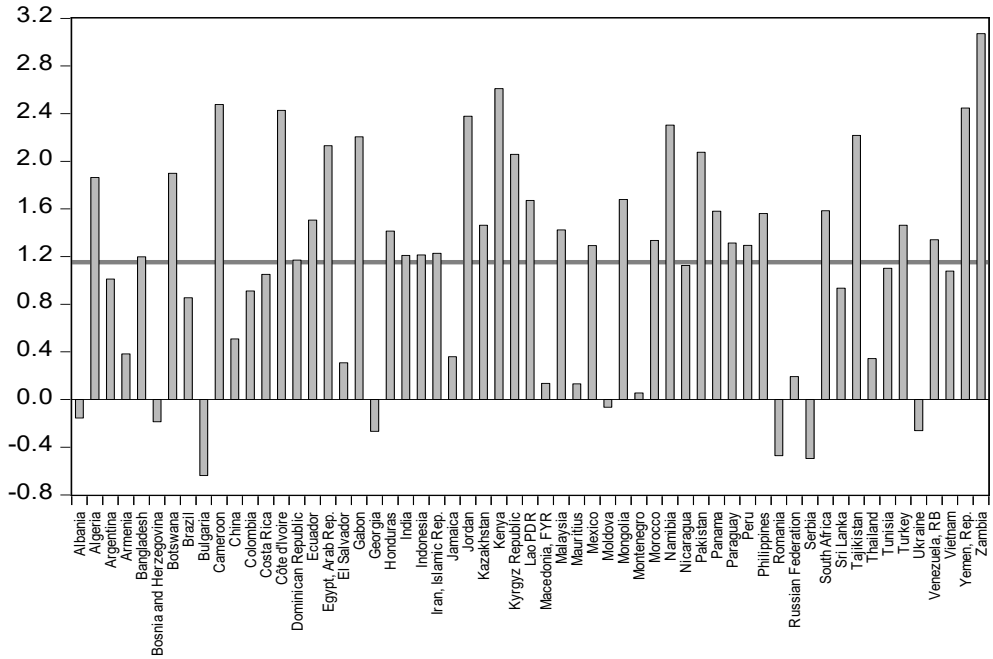

Figure 3 The population growth 2015

Source: World Bank

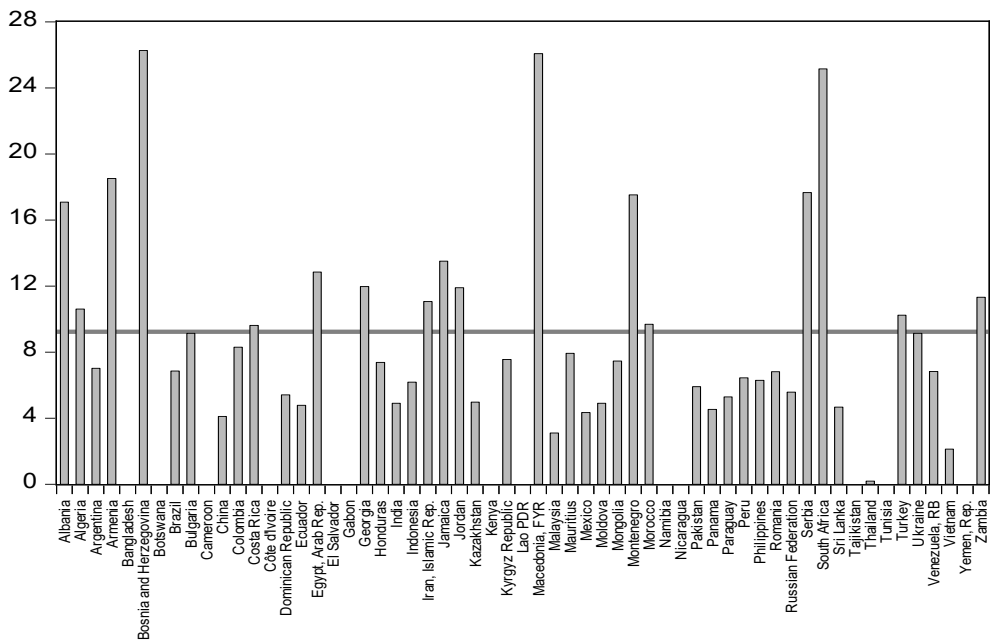

Figure 4 The unemployment rate (% of the total workforce) 2015

Source: World Bank

variable which eliminated the extremely high values of the GDP *per capita* for three countries: Argentina, Costa Rica and Panama. The dummy variable took the value 1 for these countries, and 0 in other cases. The estimated model showed that all the coefficients were statistically significant at the 10% significance level, whereas the coefficient for the Unemployment Rate was not statistically significant at the 5% level. The last result triggered a more detailed analysis of the residuals of the estimated model, by which it was determined that the residual had the highest absolute value for India. A further analysis of the indicators for this country revealed that the GDP *per capita* and the unemployment rate were inconsistent. In other words, the low level of the unemployment rate should be coupled with a high GDP *per capita*, and vice versa. Since this was not the case here, we added yet another dummy variable that had the value 1 for India, and the value 0 for the other countries. By introducing the two dummy variables, we built the final model that was used for testing the main hypothesis:

$$GDP\_pc = \beta_0 + \beta_1 WEF + \beta_2 CPI + \beta_2 POPG + \beta_3 UNEMPLOYMENT + \beta_4 DUM + \beta_4 DUM_2 + \varepsilon \quad (2)$$

The estimated model shows that all of the variables are statistically significant, including the two dummy variables at the 5% significance level.

In order to test the validity of the model, additional econometric tests are needed. First, the existence of a residual autocorrelation should be determined. The value of the Durbin-Watson statistics is 2.25, based on which the hypothesis of the existence of the first-order autocorrelation can be rejected.

The same conclusion is reached from the correlogram analysis. After testing for autocorrelation, we test for the residual normality. The value of the Jarque-Bera statistics is 1.06, with the *p* value 0.59, which means that at the significance level α=0.05 we cannot reject the hypothesis that residuals have a normal distribution.

The test of the heteroscedasticity of the residuals was performed by applying the White test. The values of the F and χ^2 statistics are 1.35 and 16.29, respectively, with the corresponding *p* values of 0.23 and 0.23, respectively, implying that at the α=0,05 level of statistical significance we cannot reject the hypothesis of the absence of the heteroscedasticity and regularity of the model's linear form. From the correlation matrix of the independent variables, it can be inferred that there is no multicollinearity in the model.

Table 1 *The estimated model*

Variable	Coeff.	Std. Error	t-Statistic	Prob.
C	818.9172	2055.959	0.398314	0.6925
WEF_VALUE	1909.741	599.4599	3.185769	0.0028
POPG	-1011.617	412.9202	-2.449910	0.0188
UNEMP	-135.8814	58.85549	-2.308729	0.0262
DUM	7196.002	1334.294	5.393118	0.0000
DUM2	-5524.342	2315.986	-2.385309	0.0219
R-squared	0.546669	Mean dependent var		5661.415
Adj. R-sq.	0.490002	S.D. dependent var		3103.315
S.E. of regression	2216.206	Akaike info criterion		18.36609
Sum squ. Resid	1.96E+08	Schwarz criterion		18.60461
Log likelihood	-416.4200	Hannan-Quinn criter.		18.45544
F-statistic	9.647135	Durbin-Watson stat		2.257815
Prob (F-statistic)	0.000004			

Source: The results of the estimated model from Eviews.

The most important conclusion of the previous regression analysis is that there is a positive impact of the effective application of the competition policy on the economic development of developing countries at the 5% significance level. Moreover, the whole regression is statistically significant and can be accepted with the equal level of significance. The determination coefficient is 0.55, which means that the independent variables account for 55% of the variations of the GDP *per capita* for the countries in our sample.

CONCLUSION

The competition policy has the role of protecting and strengthening market competition, which, in itself, provides economically efficient outcomes. Nevertheless, increasing economic efficiency has not always been the main or the sole aim of the competition policy. Throughout history, certain economies have given greater importance to the specific socio-political functions of the competition policy, whereas other countries' aspirations to creating national champions have prevailed over the need for the efficient protection of competition. Such attempts have not yielded the expected results, especially not so in the long-run. Therefore, the main objective of this paper is to establish the positive relationship between the competition policy and economic development.

The choice of the variable that best captures the effectiveness of the competition policy has proved to be the key issue related to measuring the impact of the competition policy on economic development. In the existing empirical literature, various simple and composite indicators of the competition policy have been used for that purpose. The most important conclusion to draw from these attempts intended for the estimation of the impact of the competition policy is that the mere existence of competition legislation is insufficient and must be complemented with its effective enforcement. This is the approach that we have followed in our paper, where we have chosen the WEF indicator as the proxy for the effective application of the competition policy.

Nevertheless, the limitation of the previous analysis is that the WEF indicator is based on business leaders' subjective opinions about the effectiveness of the competition policy. It would be better to use a certain composite index that would contain objective measures, such as the number of the cases successfully resolved by the Competition Commission, or the number of appeals against the Competition Commission's decisions in the court. However, these data are not available for all countries, and previous studies were faced with the same obstacle.

The choice of the other independent variables was made with the objective to avoid multicollinearity in the model. Some of these variables proved not to be statistically significant in the initial model estimation, for which reason we estimated the model by excluding these variables. Needless to say, there is room for the inclusion of other independent variables so as to increase the explanatory power of our regression.

The main contribution of our paper rests on the identified positive relationship between the effective application of the competition policy and the economic development of developing countries. The results presented in this paper are based on the sample of the 60 developing countries that currently have competition legislation in force. The initial hypothesis of this research was confirmed within the linear regression framework, where the WEF variable is highly statistically significant. The additional econometric tests confirmed the validity of the model.

Based on these results, it can be concluded that the effective implementation of the competition policy has a positive impact on the economic development of developing countries. For this reason, the entities responsible for the implementation of the economic policy in developing countries are recommended to pay special attention to the implementation of the competition policy.

The additional implication of this research study of ours is that the models of economic growth may miss one important variable: the effective application of the competition policy. Within the Solow model framework, the residual may not only capture technical progress, but also the factor that we ourselves identified. However, making the overall effect of the competition policy endogenous in the growth model, not just its effect on innovations, which was the main idea of the previous attempts, would be a challenging task to do.

This paper opens many interesting issues for further research. One possible topic for future research could be the assessment of the impact of the competition policy on the economic development of the specific sectors of the economy, which would enable policy-makers to better understand which

sectors require further supervision and control of the level of competition. The second issue is related to methodological aspects of the model specification, its functional form, and the group of the observed variables.

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