

THE RELATIONSHIP BETWEEN THE COUNTRY'S GLOBAL COMPETITIVENESS AND ITS NATIONAL MNEs

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The main purpose of this paper is to study the influence of home-multinational enterprises on country global competitiveness and to determine how this influence changes with the stage of country competitiveness. Based on the regression model, Variance Inflation Factor test and Agglomerative Hierarchical Clustering method, we analyzed the WEF Global Competitiveness Index 2017–2018 of those countries whose multinational firms were included into the Forbes Global 2000 list of 2017. The findings highlighted the important role of home-MNEs as determinants of countries' competitiveness, however MNE-related contribution of different pillars and components of the Global Competitiveness Index vary, depending on the stage of competitiveness of the studied 58 countries.

Keywords: global competitiveness; multinational firm; correlation; clustering

Introduction

Over the last decades, multinational enterprises (MNEs) have turned into the resourceful power that influences environmental, social and institutional domains of almost all national economies of the world. MNEs are shaping discourses of world merchandise and service trade, investment flows and high-tech R & D, thereby determining many patterns of national competitiveness (UNCTAD, 2016).

The importance of the national competitiveness level, in turn, increases from year to year: the indicator is used by governments to establish the goals of their development strategies, by representatives of international business to choose the most favorable country for investment, etc. (Porter et al., 2004; Priede and Neuer, 2015; Voinescu and Moisoiu, 2015).

The objective of this article is to examine premises and features of national MNEs' influence on the country's global competitiveness level. By investigating the existing theoretical and methodological approaches to the assessment of national competitiveness, we identify the contribution and role of home-multinational firms in country's competitiveness at the global level.

We will test the correlation of the country's global competitiveness positions and the number of its home-MNEs from the Forbes Global 2000 list. Then we will cluster the countries in accordance with the competitiveness level and the number of multinational firms in order to identify countries with the most similar structure of the economy and the level of functioning efficiency. These findings can be used to conduct further analysis for specific countries and to draw up recommendations for national governments based on the analysis of the closest country experience.

The study adds to the research in the field of the global competitiveness by highlighting the importance of multinational firms in increasing the level of countries' competitiveness, thus adding to the academic literature in the field and to the recommendations for national states how to increase business support for achieving a multiplier effect.

Transformation of views on the national competitiveness

At present, there are practically no advanced economies that would not create special institutions (commissions, working groups, departments) to analyze

the state of their competitiveness and would not look for the ways to increase it (e.g., Comprehensive Trade and Competitiveness Act in the USA; EU Growth, Competitiveness, Employment White Paper, etc.). However, determination of the "national competitiveness" is a rather complex, multi-level concept that does not have a single generally accepted definition. In addition, there are quite wide differences in views on the nature of the country's competitiveness among different scientists and experts in the field (Krugman, 1996; Cho and Moon, 2000; Bloch and Kenyon, 2001).

The widely-used concept of "national competitiveness" in the modern sense was introduced by Porter back in 1990. He, never giving a direct definition, described country's competitiveness as "... the productivity of resource use expressed in the value of returns per unit of labor or capital;... productivity is the main standard of living determinant in a country since it is the main source for per capita income". Thus, the welfare of the country is determined on the basis of the efficiency of firms activities, and in fact there is a sign of equality between the welfare of state and its firms. At the same time, it is obvious that the competitiveness of the national economy depends not only on the activities of its enterprises, but also on external factors (e.g., geo-economic situation, general state of the global economy) and the quality of other "stakeholders" in the country's economic system.

Hickman (1992) defined international competitiveness as the countries' ability to maintain the acceptable growth in the global economy on the real living standard with a fair distribution, effectively providing employment for everyone who can and wants to work, and doing so without reducing the growth potential of the living standard for the future generations. Hickman focuses primarily on the determinants of productivity growth while explaining international competitiveness. He links international competitiveness with a country's growth in productivity depending on 4 criteria: productivity growth rates; past and current trade policies; various models of technological change followed by another economic system and a special growth strategy; specific characteristics of countries (natural resources, geographical location and history).

Krugman (1994) initiated an extramural debate with Porter, stating that national competitiveness is a political slogan which does not have a theoretical basis, since the countries' economic relations cannot be likened to the firms' economic relations, and exaggeration of external threats to

national competitiveness is a justification for protectionism, increased state intervention and reduced economic efficiency.

Haque (1995) used the concept of “competitive power” and defined national competitiveness as a country’s ability to produce goods and services that meet the requirements of international markets while maintaining and expanding real income, as well as increasing the level of its citizens’ welfare. Klein (Harvard Business Review, 1997) puts forward a sustainable economic growth rate of 3–4% per year as the main distinguishing feature of a competitive economy, which should ensure a steady increase in living standards. Bloch and Kenyon (2001) highlight the higher exports and imports level as the main terms of international competitiveness. At the same time, the country’s ability to realize the objectives of the central economic policy, especially the growth of income and employment, without facing balance of payments difficulties, is the main definition of its competitiveness. Delgado et al. (2012), introducing the concept of foundational competitiveness, once more confirmed Porter’s approach of 1990 defining it as the expected level of output per working-age individual that is supported by the overall quality of a country as a place to do business.

Modern studies of the concept recognize the states, research institutions and multinational firms as the main institutional factors affecting the national competitiveness. The International Institute for Management Development (IMD), treats country’s competitiveness as a field of economic knowledge that analyzes facts and policies that shape the country’s ability to create and maintain conditions that ensure the creation of additional value from enterprises and a higher level of population welfare. Irish National Competitiveness Council (2019), defining national competitiveness since 1997 “as the ability of enterprises to compete successfully in international markets”, ensures that “competitiveness is not an end in itself, but a means of achieving sustainable improvements in living standards and quality of life”. The OECD (2013) defines international competitiveness as the “ability of a country (region, location) to deliver the beyond- GDP goals for its citizens”. The World Economic Forum (WEF, 2016) approaches it as “the set of institutions, policies and factors that determine the level of productivity of a country”.

It is important that the above definitions do not contradict each other as they reflect various aspects of the country’s competitiveness issue. Presented concepts allow to assert that the definition of national competitiveness has a rather wide scope of coverage, including economic aspects along with the social, political, environmental and others.

Global competitiveness measurement frameworks

If we summarize what was said in the previous part, the concept of competitiveness is the approach under which a country is characterized primarily by the dynamic development of its productivity and trade, while raising the living standards of its citizens. However, since the standard of living cannot be measured only by the GDP per capita indicator, experts often include such parameters as the quality of life in the country, average life expectancy, quality of education, innovative activity and others. As a result, the quantitative definition of the comparative competitiveness level expands to tens and hundreds of indicators.

Historically the first most comprehensive and well-known methodology for assessing the competitiveness of the economy was the methodology of the European Management Forum (1970-ies) which later, in 1987, transformed into the WEF. The initial study of the European Forum applied only to 22 OECD countries and was based on 10 factors evaluated by a number of indicators (WEF, 2009).

Conceptual study on international competitiveness by Porter contributed to a qualitative leap in the methodology for calculating the level

of country competitiveness and significantly influenced the further evolution in this field. The competitiveness assessment of the IMD is based on the main factors of his Diamond model; the methods used by the WEF until 2018 – on the Porter’s stages of development; and the Institute for Industrial Policy Studies (IPS) also bases its assessment on the factors of Porter’s Diamond model, but more expanded and improved.

The most important result of Porter’s study is undoubtedly the compilation of the Diamond model, the essence of which is to identify the basic four systems of factors: related and supporting industries, demand conditions, factor conditions, business context (firm strategy, structure, and rivalry) that determine the competitiveness of the economy, and then study their mutual influence on competitiveness. Analysis of the conditions for the Diamond model development in various countries and the ability of some countries to prosper having only several components of the Diamond led Porter to identify four stages of the country’s competitiveness development: factor-driven, efficiency- or investment-driven, innovation-driven and wealth-driven (Porter, 1990; WEF, 2001).

The international competitiveness study approach of the WEF is the most comprehensive one out of the three main world ratings – WEF Global Competitiveness Report, IMD Global Competitiveness Report and IPS Report. It has the widest coverage of countries (more than 130 countries representing about 97% of world GDP) and open-access methodology and calculations for all of them. So for the future analysis we will use the data of the WEF. The main difficulty in analyzing and applying the results of the WEF study is its constant changes and revisions. This leads to inability to compare the results over a long period of time, and, therefore, to fully assess the analytical and prognostic capabilities of the methodology used. In 1990-ies, WEF was calculating as single competitiveness index – World Competitiveness Index. Since 2000 WEF calculated two indexes: Growth Competitiveness Index, which determined the ability of the economy to achieve constant economic growth in the medium and long-term, and Business Competitiveness Index, which emphasized the development of company-specific factors that contribute to improving efficiency and productivity at the micro level. In 2004, single index – Global Competitiveness Index was introduced, presenting a new methodology: two indexes of macro- and micro-competitiveness with an expanded list of components (indicators), reflecting 12 factors of competitiveness where the weight of each depends on the stage of competitiveness development (WEF, 2016). In 2018 the Global Competitiveness Index 4.0 was presented which emphasizes the role of human capital, innovation, resilience and agility, as not only drivers but also defining features of economic success in the Fourth Industrial Revolution (WEF, 2018).

Materials and methods

We obtained our data from two sources: WEF Global Competitiveness Report and Forbes Global 2000 list.

As far as the new methodology of WEF was introduced only in one report of 2018, we used the previous methodology of 2004–2017 for our research which calculates the Global Competitiveness Index (*GCI*) as follows:

$$GCI = \alpha_1 \times BR + \alpha_2 \times EE + \alpha_3 \times IS$$

where:

- $\alpha_1, \alpha_2, \alpha_3$ – the weights of each subindex in the general index (the sum of the coefficients $\alpha_1, \alpha_2, \alpha_3$ is equal to one)
- BR* – Basic Requirements value
- EE* – Efficiency Enhancers value
- IS* – Innovation and Sophistication factors value

The results of the countries comparative competitiveness level are presented in the form of a ranking, where the first place is given to the most competitive economy.

Dependence “country’s home-MNEs – country’s global competitiveness”

For the empirical analysis, we select the number of country’s MNEs included in the Forbes Global 2000 rating, as an independent variable of the regression model. Forbes Global 2000 is the most comprehensive rating of the world’s largest international companies in terms of approach to ranking (three key performance indicators – sales, profits and assets) and the number of analyzed firms.

We investigate if there is a linear relationship between the number of multinational firms of a particular country and its level of competitiveness.

The hypothesis is as follows: the more MNEs the country has, the higher global level of competitiveness is; in other words, the level of development and competitiveness of the country determines the number of successful firms that originated in that country.

Forbes Global 2000 firms of 2017 list belong to 58 countries. Based on the sample of these countries, the following regression model was obtained:

$$Y = 4.649 + 0.003X + \varepsilon$$

where:

- Y – country’s global competitiveness level
- X – number of country’s MNEs in the Forbes Global 2000
- ε – combination of other factors not included in the model

The model allows to make very specific and sufficient conclusions (although quite rough because of the model simplicity: the variation of the dependent variable by 14% is determined by the variations of the independent variable) that with the increase in the number of successful and large MNEs in the country by 1 enterprise, the competitiveness level can increase by 0.003 points.

The next step is conducting a regression analysis where the number of country’s firms in Forbes Global 2000 is a dependent variable. As for the independent variables, initially there were 12 of them – 12 pillars of the WEF *GCI* 2017. However, in this case the multicollinearity between explanatory variables of the model is inevitable: all of them are the components of the same index and describe the state of one particular country where, in case the country is sufficiently developed, it is logical to have quite high values for almost all components of its competitiveness and vice versa.

Out of the 12 variables (institutions, infrastructure, macroeconomic environment, health and primary education, higher education and training, goods market efficiency, labor market efficiency, financial market development, technological readiness, market size, business sophistication, innovation) we excluded the following 4: infrastructure; goods market efficiency; technological readiness; business sophistication, due to the fact that according to the test results, they were not significant and adversely

affected the significance of the model as a whole. After tests that verify the significance of the model, we built the following regression model based on a panel of 58 countries:

$$Y = -430.68 - 28.545X_1 - 24.384X_2 + 17.263X_3 - 18.445X_4 + 55.426X_5 + 24.187X_6 + 52.046X_7 + 23.709X_8 + \varepsilon$$

where:

- Y – number of country’s MNEs in the Forbes Global 2000
- X_1 – institutions
- X_2 – macroeconomic environment
- X_3 – health and primary education
- X_4 – higher education and training
- X_5 – labor market efficiency
- X_6 – financial market development
- X_7 – market size
- X_8 – innovation
- ε – combination of other factors not included in the model

Despite the obvious multicollinearity, all parameters of the model have successfully passed the Variance Inflation Factor (VIF) test which indicates the significance of variables on regression model and their suitability for further conclusions. At the same time, 44% of the variation in the dependent variable is explained by the variations in the values of the independent ones, which is fairly large, taking into account the complexity of the phenomena being investigated.

Results and discussion

Do home-MNEs impact equally the global competitiveness of countries if they are at different stages of competitiveness?

We conducted an in-depth analysis of the country’s competitiveness components assessed by WEF (2004–2017), IMD (2017) and IPS (2014–2015). The following common components of these 3 ratings which directly relate to MNEs were determined: ethical behavior of firms; intensity of local competition; buyer sophistication; cooperation in labor-employer relations; pay and productivity; venture capital availability; FDI and technology transfer; company spending on R & D.

On the next stage we measured the level of selected factors in 58 countries at different stages of competitiveness (Table 1). The countries we studied were the ones that we earlier opted from the Forbes Global 2000 2017 list.

The average assessment of each component was identified for every group of countries. The results are presented in Figure 1.

In addition to the obvious and reasonable predominance of component values in countries at a higher stage of competitiveness over the ones at a lower stage, the smallest growth in the component level with an increase in the country’s competitiveness stage is observed when evaluating the

Table 1 Classification of countries by WEF stages of competitiveness

Competitiveness Stage	Factor-driven	Efficiency (Investment)-driven	Innovation-driven
Countries	<ul style="list-style-type: none"> ■ India, Pakistan, Kuwait, Mongolia, Nigeria, Philippines, Venezuela, Vietnam 	<ul style="list-style-type: none"> ■ Brazil, China, Colombia, Indonesia, Peru, Argentina, Chile, Hungary, Lebanon, Malaysia, Oman, Poland, Saudi Arabia, Turkey, Egypt, Mexico, Morocco, Russia, South Africa, Thailand 	<ul style="list-style-type: none"> ■ Australia, Austria, Bahrain, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Israel, Italy Japan, Luxembourg, Netherlands, Norway, Portugal, Qatar, Singapore, South Korea, Spain, Sweden, Taiwan, United Arab Emirates, United Kingdom, United States, Switzerland

Source: Authors

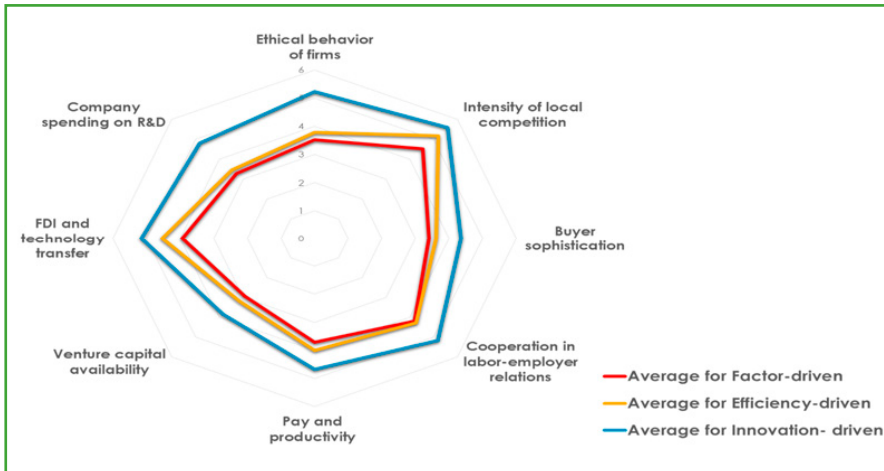


Figure 1 The components average value for different country-groups
Source: Authors

“intensity of local competition”. Therefore it can be assumed that at a certain point the improvement’s maximum level of a particular component is reached – corresponding to the market value and economy size – which is achieved at the Efficiency (Investment)-driven stage and further development of the indicator is difficult.

The most serious gap is observed in the value of the “ethical behavior of firms” and “company spending on R & D”, which indicates that the transition to an innovative type of development allows to improve these dimensions. This fact is particularly noteworthy in the context of the obtained data on the degree of the country’s competitiveness dependence on the MNEs number with respect to country groups (Figure 2).

With an increase in the competitiveness stage and, accordingly, a change in the economy structure and sources of competitive power, the dependence on the MNEs activities in the countries decreases. That dependence is particularly reduced when the country moves from the Efficiency-driven to the Innovation-driven stage. In general, this paradox can be explained by an increase in the overall efficiency of functioning of all the country’s institutions, so the absolute efficiency of MNEs also rises, and as it is shown in Figure 1 – social responsibility and R & D expenditures of firms (one of the key indicators for ensuring innovative growth of the economy) increase. However, at the same time, the degree of relative influence of MNEs in the overall contribution of other stakeholders decreases due to the fabulous growth in their overall efficiency.

Proving the importance of multinational firms for the overall level of national competitiveness, on the next stage we used the Agglomerative Hierarchical Clustering method as it enables to distinguish large clusters of analyzed countries according to the main factors that shape the country’s competitiveness and the number of its MNEs (from Forbes Global 2000 list).

We identified three large clusters (Table 2). Cluster 1 includes countries with the highest development rates; Cluster 2 – with a relatively average level of development of national institutions; Cluster 3 – countries with the lowest level of global competitiveness. Hierarchical relationships between clusters are shown in Figure 3.

Cluster 2 and Cluster 3 have interconnections between each other, while Cluster 1 is separate. At the same time, Cluster 1 has the most complex structure of relations between countries, as well as the highest rate of intracluster variation.

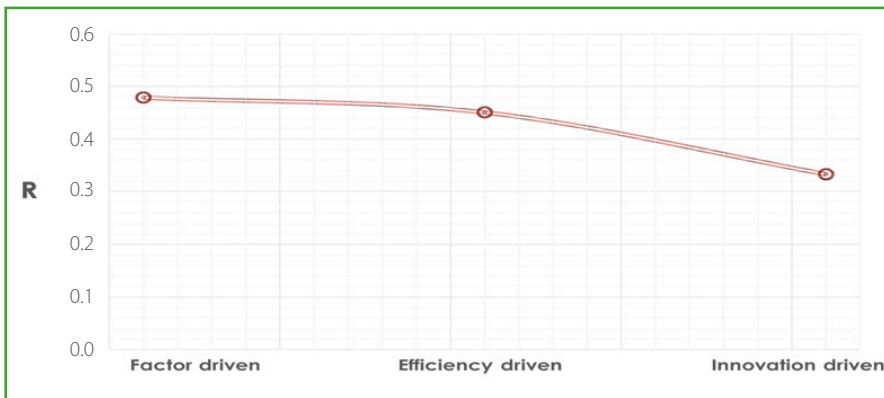


Figure 2 Correlation between country’s competitiveness level and the number of its home-MNEs
Source: Authors

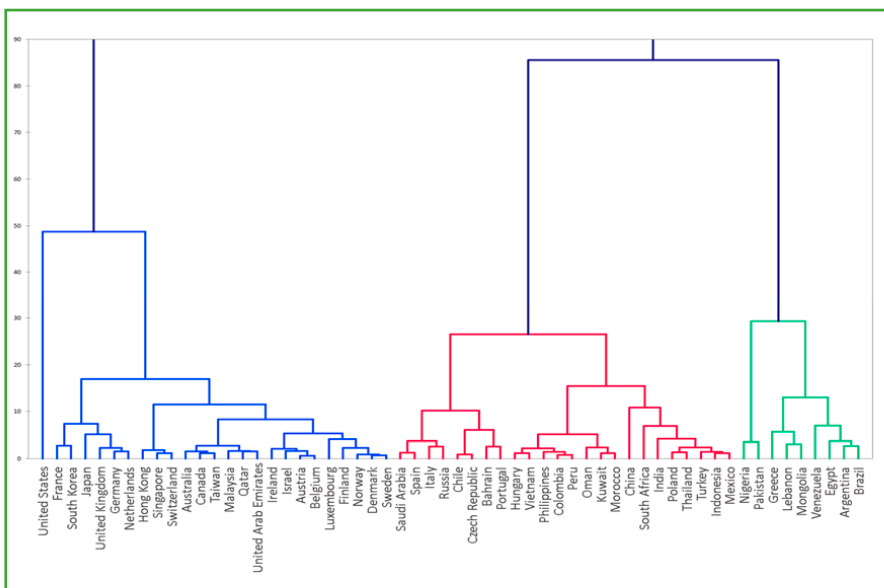


Figure 3 Country-clusters in accordance with their stage of competitiveness and number of home-MNEs (Agglomerative Hierarchical Clustering method)
Source: Authors

Table 2 Distribution of countries from Forbes Global 2000 2017 list within clusters in accordance with country's stage of competitiveness and number of home-MNEs

Cluster	Countries
Cluster 1	Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Japan, Luxembourg, Malaysia, Netherlands, Norway, Qatar, Singapore, South Korea, Sweden, Switzerland, Taiwan, United Arab Emirates, United Kingdom, United States
Cluster 2	Bahrain, Chile, China, Colombia, Czech Republic, Hungary, India, Indonesia, Italy, Kuwait, Mexico, Morocco, Oman, Peru, Philippines, Poland, Portugal, Russia, Saudi Arabia, South Africa, Spain, Thailand, Turkey, Vietnam
Cluster 3	Argentina, Brazil, Egypt, Greece, Lebanon, Mongolia, Nigeria, Pakistan, Venezuela

Source: Authors

The USA is the only country out of all 58 that is not part of any subcluster within the general group and, thus, it can be concluded that it possesses a unique structure and characteristics of the economy in terms of global competitiveness. The EU-countries, as expected, are equally included in Cluster 1 and Cluster 2. The only exception is Greece which belongs to Cluster 3 and has characteristics close to Lebanon and Mongolia. The BRICS countries are a part of Cluster 2 (exception – Brazil, Cluster 3). Moreover, India, China and South Africa form a common subcluster, while Russia is close to Italy, Spain and Saudi Arabia. The countries of Cluster 3 have the highest degree of closeness and similarity out of all the cluster groups.

In order to better analyze the characteristics of each cluster, we performed an analysis using the Parallel Coordinates Plot data tool (Figure 4).

Based on the model obtained after the regression analysis and VIF test of Forbes Global 2000 and 12 pillars of WEF *GCI* in 2017, the following conclusions can be drawn:

1. Development and improvement of some pillars' quality negatively affect the development of the country's transnational firms (an increase in the number of home-MNEs) or, at least, do not play a positive role in emergence of new MNEs. Among these pillars are:

- institutions (state – property rights, ethics and corruption, undue influence, public-sector performance, security, and private-corporate ethics, accountability);
- macroeconomic environment, including government budget balance, gross national savings, inflation, government debt, country credit rating;
- higher education and training, including the quality of education, management schools and on-the-job training.

Explaining the obtained results, it can be assumed that the low quality of the home-country's institutions, macroeconomic environment and the lack of labour force and personnel of the required qualification are the main drivers for internationalization of companies in most cases. Thus, it is quite logical that good performance of these pillars reduces motivation for internationalization for many companies, since they operate quite comfortably in their home market.

At the same time, it should not be forgotten that this analysis was conducted only with respect to national MNEs, so it is obvious that when analyzing the impact of certain areas of

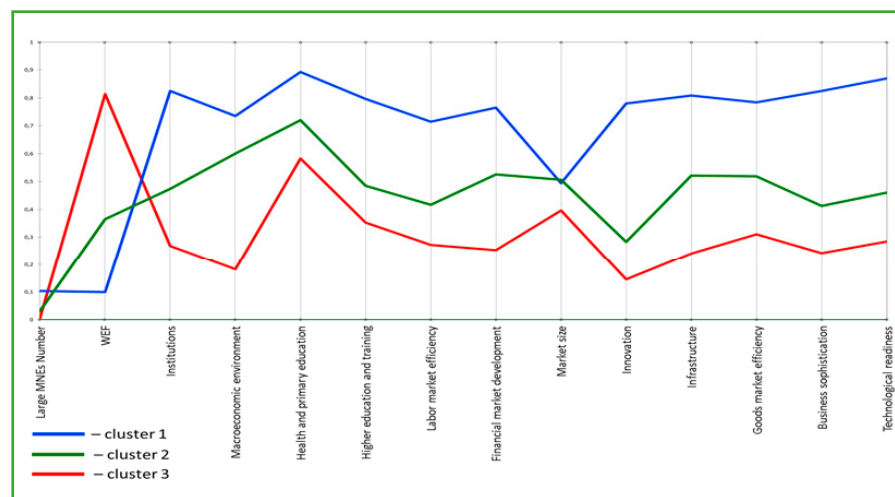
the country's development on attracting FDI, the same indicators will play a positive role as an additional incentive.

The biggest effect on the development of the country's MNEs is ensured by the improvement of such pillars as:

- labor market efficiency, including flexibility (cooperation in labour-employer relations, flexibility of wage determination, hiring and firing practices, redundancy costs, effect of taxation on incentives to work) and efficient use of talent (pay and productivity, reliance on professional management, country capacity to retain and attract talent, female participation in the labor force).
- size of the market: domestic market size, foreign market size, GDP, exports as % GDP.

The impact of such pillars as health and primary education (malaria incidence, business impact of malaria, tuberculosis incidence, business impact of tuberculosis, HIV prevalence, business impact of HIV/AIDS, infant mortality, life expectancy and quality of primary education, primary education enrollment rate); development of the financial market (efficiency, trustworthiness and confidence, soundness of banks, regulation of securities exchanges, legal rights index); innovation potential (capacity for innovation, quality of scientific research institutions, company spending on R & D, university-industry collaboration in R & D, government procurement of advanced technology products, availability of scientists and engineers, PCT patents) plays minor but still positive role on the development of national MNEs in the country.

Thus, the development of national MNEs is necessary not only and not as much because of maintaining the reputation and authority of the country on the world arena but for making a real contribution into the country's development and the welfare of its citizens. The more MNEs are based in the country, the stronger and more ramified is their network of foreign units, the greater their presence in world markets, the

**Figure 4** Key characteristics of obtained country-clusters within WEF *GCI* 12 pillars of competitiveness

Source: Authors

stronger and more developed the country will be in all senses. Moreover that is always a bilateral process: the greater and stronger the MNEs of the country, the better and more developed is the country's economy and vice versa, the stronger the economy of the country, the greater and more powerful will be its MNEs.

These findings were also proved by the Agglomerative Hierarchical Clustering of 58 countries in accordance with their stage of competitiveness and number of home-MNEs. As was expected, Cluster 1 has a higher level of basic characteristics of competitiveness. Countries of this cluster possess a large number of successful MNEs and are closer to the top of competitiveness ranking. Noteworthy, the size of market of Cluster 1 countries is equal if not less than of those in Cluster 2 and 3; while the largest gap between Cluster 1 and the other two is in the "innovation", "level of infrastructure development", "market efficiency", "business satisfaction" and "level of technological readiness".

Characteristics of Cluster 2 in almost equal proportion are exceeding the corresponding characteristics of Cluster 3 while having significantly higher positions in the competitiveness rating and a bigger number of successful MNEs. The most significant gap is in the "macroeconomic environment".

Conclusions

By the end of the 20th century, a full-scale perception of national competitiveness as a quantitative parameter has evolved. Among different approaches to its measurement, WEF methodology is the most comprehensive and public, so in our calculations we were addressing the Global Competitiveness Rating of 2017–2018.

Our analysis indicated that along with the general output factors, the number of home-MNEs has a significant impact on the overall level of national competitiveness.

We found that the more "strong" MNEs the country has, the more competitive it is in the global environment. Moreover, the more efficient the labor market in the country and the larger the market size are, the better these MNEs will develop. In turn, improvement of the quality of home-country institutions and the higher level of education negatively affects the national firms' motivation to start the internationalization process and enter foreign markets.

On average, 30% of all the countries competitiveness parameters analyzed by the WEF, IMD and IPS are directly influenced by multinational firms. However, the higher the country's competitiveness stage is, the lesser the relative influence of its home-MNEs is.

The results of our research are of great interest for policy makers in the search for ways to increase national competitiveness. By identifying three clusters of countries with similar characteristics, we got the opportunity to suggest a development vector for certain national states. This analysis allows to determine the similarity of factors between different countries and examine the experience of development and improvement of national economy in those countries which belong to one sub-cluster.

Emphasis should be placed on the improvement of certain indicators in order to form the basis for the transition to a "higher" cluster or holding the obtained positions in certain cases.

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