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CRACOW UNIVERSITY OF ECONOMICS
Department of International Trade
Centre for Strategic and International Entrepreneurship

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Department of International Trade
ul. Rakowicka 27, 31-510 Kraków, Poland
phone +48 12 293 5376, -5307, -5381, -5327, fax +48 12 293 5037
e-mail: eber@uek.krakow.pl
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Entrepreneurial Business and Economics Review

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# Public and Expert Opinions on Free Trade Agreements in South America

**Krzysztof Beck, Bogna Gawrońska-Nowak, Paul Valdivieso**

**ABSTRACT**

**Objective:** Free Trade Agreements (FTA) have recently drawn public attention due to political populism, alter-globalisation, and tendencies to redefine economic ties, together with the stereotype of mismatching social perception and so-called 'expert knowledge'. Confronting this stereotype may contribute to better understanding of FTA controversies and identify possible vulnerability sources at the policy implementation level.

**Research Design & Methods:** To analyse FTA impact, meta-analysis of the literature research results was performed using the sample of eight Spanish language papers. We included models in which natural logarithm of a trade measure was regressed on FTA dummy variable with other explanatory variables following Viechtbauer (2010).

**Findings:** With FTA dummy variable increased trade can have its sources both in trade creation and trade diversion. Also, the endogeneity issue might result in overestimation of the effect, as countries that trade more are more likely to establish a FTA. Weighted least squares fixed effects models at both the study and the model level support this notion. Unweighted least squares models for Spanish language papers are the only ones where the positive effect of FTA is not statistically significant.

**Implications & Recommendations:** Spanish language literature gives a lot of support to the notion that FTAs are associated with higher trade. However, the exact size of the effect can be brought to question.

**Contribution & Value Added:** Public opinion in South America seems quite supportive for FTA and economic integration. Meta-analysis results confirm positive FTA effects, supporting its use as a convincing argument for further integration.

**Article type:** research article

**Keywords:** Free Trade Agreements (FTA); meta-analysis; public opinion

**JEL codes:** F13, F14, F53, F55, Z13

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## INTRODUCTION

Recently Free Trade Agreements (FTA) have been drawing public attention being affected enormously by new waves of political populism, alter-globalisation, and some tendencies to redefine patterns of the world economic ties. From the European perspective, especially the Comprehensive Economic and Trade Agreement (CETA), and the Transatlantic Trade and Investment Partnership (TTIP) have brought 'on board' serious public concerns about environmental protection, food quality, job security, and citizen rights. Donald Trump openly criticizes the North American Free Trade Agreement (NAFTA) calling it 'the single worst trade deal ever approved in this (US) country'.

It is interesting to find out if South American public opinion on FTA is affected by similar populist tendencies. There is also quite a common stereotype that there is a mismatch between social perception concerning FTA with the so-called 'expert knowledge'. Defining a mismatch between the social perception and the expert knowledge may contribute to better understanding of the controversies on FTA, as well as to properly defining possible sources of social conflicts and vulnerabilities of the policy at the implementation level. Having examined relevant studies on the social expectations in Europe concerning FTA (for example Bertelsmann Foundation, 2016; Eurobarometer 2014; 2015) one can observed that the analysis should be developed and continued in more detail, including country-specific and time-variant dimensions.

In our article we have a look at Latinobarómetro results to describe public opinion on FTA in South America and we confront them with so-called 'expert opinions'. To do so we try to confirm in a statistically significant way if there is a key message in the Spanish language expert materials about trade and its effects that the experts could disseminate to the world.

In section 2 we briefly summarise historical evolution of FTA in South America. Section 3 provides us with public opinion on FTA and economic integration. In section 4 we present descriptive analysis of the Spanish language expert databases and methodological approach towards meta-analysis, while section 5 shows its results. Section 6 concludes.

## LITERATURE REVIEW

### Free Trade Agreements in the Region: Present and Past

South America, along with Latin America as a whole, has historic and social conditions that favour integration. The region has multiple homogeneity traits when compared to other world regions. In particular, cultural, linguistic and religious similarities should be highlighted. However, at the same time some political disagreements and periodical instabilities must be considered (Thoene, Zamora, Júnior, & Londoño, 2017; Shuaibu & Oladayo, 2016; Crespo Stupková, 2016). Economic growth and poverty reduction require trade, which in turn would only increase with openness and integration occurring in an environment where supportive initiatives ensure that the benefits of trade spill to all the society (WTO, 2015). The region has a long history of integration efforts and trade agreements evolving in line with varying trade policy frameworks. This trend currently continues, even though the focus of the various trade agreements has varied over time together with the political context (Figure 1).

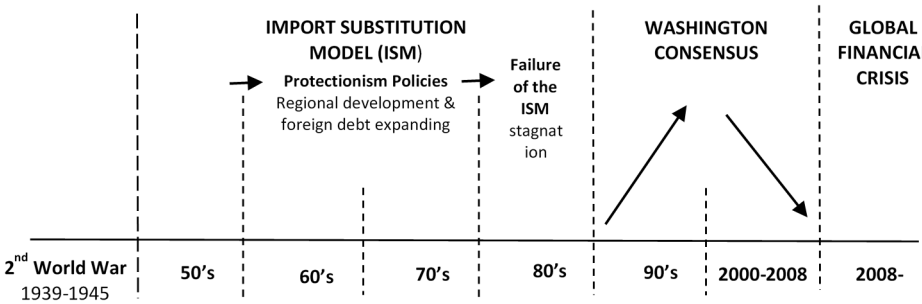


**Figure 1. Evolution of trade policy frameworks after the 2nd World War**
Source: own elaboration.

After the Second World War, South American countries adhered to the Import Substitution Model (ISM) as a development paradigm set by the United Nations Economic Commission for Latin America and the Caribbean ECLAC (or CELAC in Spanish) which was formed in 1948, in opposition to the United States-led Pan Americanism concept. From then onwards, the South American countries have had a central role in cooperation and regional integration processes (Bermúdez Torres, 2011).

The ISM was aligned to increasing manufacturing in the region together with a diminished level of the European exports. Martínez Rangel and Soto Reyes Garmendia (2012) highlight the evolution of the region's policy framework over the last decades, starting from the ISM with a period that ranges from 1950 to the early 1980's when the governments' role was questioned as the benefits from growth were not perceived by a large proportion of the population. By the end of 1960´s and during the 1970's, efforts were focused on regional development through protectionist policies while expanding foreign debt levels to fund the development model. In the 1980´s it became quite evident that the model was inoperative reaching a stagnated environment with no economic growth, impending recessions and diminishing debt-servicing capacity for most countries, which led to a number of defaults including the cases of Brazil, Mexico and Argentina. By the end of 1980's the results of the ISM were bleak in South and Latin America, with high public deficit, restricted local financial and foreign exchange markets, goods markets that were closed to world competition, restricted foreign investment, inefficient public firms and multiple labour market constrains.

The Washington Consensus represented an open and liberalised approach with pro-market initiatives, limited state intervention and macroeconomic discipline. The consensus was based on economic openness aimed at fostering international trade between developing and developed countries as a vehicle for economic growth. Reduced government intervention brought increased social tensions due to the reduction of subsidies and incomplete compensation programmes, which in some cases resulted in social unrest episodes.

During the early 21st century, multiple South American governments initiated a shift in orientation essentially representing a departure from the neoliberal model, with regional agendas differing from those aligned to the consensus. From the 2000's onwards, regionalism starts to claim a simultaneous economic and political dimension, also allowing

for a more active government role in managing globalisation challenges. Social aspects become a key component in line with social development objectives (e.g. UN's Millennium Objectives). This development occurs in line with reconsideration of the role of the state and the extent of its reach (Bizzozero, 2011a; Świerczyńska, 2017).

Tokatlian (2012) describes that South America suffers from an 'integration complex' with ambiguous results in a region representing a heterogeneous unity, particularly when referring to the political direction within countries. This characteristic is reflected in the existence of multiple blocs and trade agreements evolving simultaneously in a changing political landscape (Ulloa Urrutia & Marambio, 2014), highlighting that integration ideas are deeply ingrained, assuming that all countries in the region are involved in at least one integration initiative (Rhi-Sausi & Oddone, 2013).

Currently, the main active trade blocs with relevant presence of South American countries are the Southern Common Market (Mercosur) formed in 1991 and currently with five full members: Argentina, Brazil, Paraguay, Uruguay and Venezuela; the Pacific Alliance (PA) formed in 2011 and currently with four full members: Chile, Colombia, Mexico and Peru; the Andean Community of Nations (ACN) formed in 1969 and currently with four full members: Bolivia, Colombia, Ecuador and Peru; and the Bolivarian Alliance for the Peoples of Our America (ALBA) formed in 2004 and currently with eleven countries as full members: Antigua and Barbuda, Bolivia, Cuba, Dominica, Ecuador, Grenada, Nicaragua, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines and Venezuela[1].

From this group, Mercosur and the Pacific Alliance are of particular relevance, given that they represent the two largest in terms of the size of their economies. Based on International Monetary Fund data[2], for 2017 Mercosur represented approximately 3.7% of the world's GDP and the PA 3.2%, whereas the ACN accounted for 1.1% and ALBA for 0.6%. The Spanish language expert database is built with focus primarily on Chile, although expanded to South American nations participating in the above listed agreements (i.e. Argentina, Brazil[3], Paraguay, Uruguay, Venezuela, Colombia, Peru, Bolivia and Ecuador).

In terms of the nature of the main agreements, Mercosur is designed as a free trade zone and customs union, and even though it was established in 1991, progress towards full implementation has been slow. Moreover, it serves as an example of the effects of an on-going political change in economic policy and trade relations within a major trade bloc, and of the potential evolution of trade blocs towards more open arrangements (i.e. fomenting bloc relations with non-bloc parties). On the other hand, the Pacific Alliance, a newer initiative started in 2011, represents a new pragmatic approach in which economic aspects are not secondary to political considerations. Furthermore, the PA constitutes an agreement where the relation of the block with third parties are as important as

[1] Additional regional blocs could be mentioned, such as the Community of Latin American and Caribbean States (CELAC) and the Union of South American Nations (UNASUR), although these are by conception primarily political organisations rather than trade blocs. There are other trade blocs in the Latin American region, being the most important the North American Free Trade Agreement (NAFTA), although, this agreement is beyond the scope of the analysis, given that it does not include any South American nations.

[2] The data considers only full members, as those represent the countries having fully adopted the agreement. However, it must me mentioned that each of these agreements incorporate associated or observer countries. The percentage corresponds to the Gross domestic product based on purchasing-power-parity (PPP) share of world in total as indicated in the IMF's World Economic Outlook (October 2017).

[3] Literature review is limited to documents published in the Spanish language.

intra-bloc relations. Therefore, it represents a new model of a trade agreement and integration structure, and as such it is of key importance as a potential marker for the evolution of these type of initiatives in the region and beyond.

The 2011-2017 period is of particular relevance in terms of events determining the current and potential future situation for the trade agreements in which South American countries partake. One particular event occurred in 2011 with the undertaking of foundational steps towards the creation of the Pacific Alliance, representing a more mature strategy with increased alignment between commercial and political interests (Rojas & Terán, 2016). A second event was the restructuring of both Mercosur and Andean Community starting in 2011 with Venezuela effectively leaving the ACN for incorporation into Mercosur, an event also serving to exemplify the prevalence of political interest over economic integration (Gutierrez, 2013), a phenomenon visible in earlier-generation agreements.

**Regional Public Opinion on Integration**

At present, regional integration can be seen as an incomplete project, with limitations such as reduced intraregional trade, lack of coordination, and the existence of multiple simultaneous integration attempts following different approaches and ideological perspectives (Bárcena, Prado, Rosales, & Pérez, 2014; Bruslé, 2015; Benešová, Novotná, Šánová, & Laputková, 2016). Optimising and integrating the multiple initiatives that have been developed over the last 60 years, involving tens of agreements and over 15 national associations with a variety of supranational bureaucratic structures is imperative (Foxley, 2015). Nevertheless, the reality is that political interests can disrupt long term advances in commercial aspects, as has been seen within Mercosur or with the clash of ideas between the ACN and the ALBA, where political adherences have recently been the sole determinant of economic policy (Giacalone, 2013), and through the critical views over the PA due to being an economic minded agreement among pro-market governments (Nolte & Wehner, 2014).

Traditionally, at relatively early integration stages, innovative organisational arrangements have been greatly valued, even despite the absence of major results (Bizzozero, 2011b). In contrast, decades after the conception, the agreement is evaluated from a more critical perspective, as recent public opinion commonly focuses on the lack of consistency between promises and reality, as well as institutional inefficiencies, even if some degree of social and political improvements are a reality (Caballero Santos, 2014).

Within the South American context, the implementation of social policies towards welfare increases is identified as the key political consideration and trade is seen as an active tool towards this objective. Latinobarómetro Corporation, a private non-profit organisation, based in Chile, is responsible for carrying out Latinobarómetro's public opinion surveys providing a regional view on multiple topics, including current regional integration profile.

Over time, public views on economic and political opinions can and do change, both as a political change catalyst and as a social reaction to policy measures or international environment. Latinobarómetro has performed multiple public opinion surveys from 1995 to 2017[4], therefore allowing to review the public opinion evolution on a variety of aspects. In 1995, 74% of the surveyed supported an economic system based on private enterprises with varying degrees of government intervention, and only 11% supported the notion of

[4] Latinobarómetro annual public opinion surveys from 1995, 2000, 2005, 2010, 2015 and 2017.

no government intervention, which can be consistent with early reactions to the application of Washington Consensus-based measures in the absence of efficient social compensation efforts. When evaluating the situation in 2005 (at the early stages of new post Washington Consensus) one may observe that there is, however, a general support for a market economy although combined with well-expressed social sentiments for government intervention (63% of the population is in favour). At the same time, public opinion on the efficiency of recently privatised public services is not positive (with 58% of the population displaying dissatisfaction with the post-privatisation situation).

At this point, it is of key importance to assess public views on integration within the region during the period, which could be summarised in Table 1.

**Table 1. Public opinion on regional economic integration**

| Public opinion | 1995 | 2005 | 2010 | 2017 |
|---|---|---|---|---|
| In favour of economic integration | 64% | 65% | 65% | 77% |
| Against economic integration | 17% | 21% | 12% | 16% |

Source: Latinobarómetro annual public opinion surveys from 1995, 2005, 2010 and 2017 available at www.latinobarometro.org and consulted on 15 August 2018.

It should not be so surprising that in the 90s and the period before the global financial crisis more than half of the population believed that belonging to integrated economic blocs or being engaged in FTAs is beneficial, with much less than one fifth disagreeing with this view. However, it is interesting to see that such a high level of support was maintained after the crisis outburst and it grew up in more recent times. It seems that a desire for free access to goods and services within the region still exists (is getting stronger) and is deeply ingrained in the South American public psyche, even if 'the integration project' is lacking its feasibility in economic, political and social spheres (Bermúdez Torres, 2011). An increase in public support for economic integration may also result from positive macroeconomic performance of some regional economies, and thus an increase in social wealth. Moreover, the development of the PA, TTP negotiations and revamping of Mercosur in line with political changes in some countries may have played its role. Interestingly, support for political integration increased, as well as the proportion of those against it, which can be explained by a lower number of non-respondents but also attributable to the desire for a more mature institutional framework, in other words, advancing in closing the gap between de facto and de jure realities.

Consistently, in 2017, 77% of respondents supported other (in the region) countries' free access to goods and services in the region, and 88% of the surveyed population was for workers' free access to other regional markets. This positive view is consistent with the wider opinion of 4 out of 5 inhabitants that globalisation brings opportunities for economic growth. Furthermore, the majority of the population identified free trade as a key component to integration, which is aligned with acknowledging integration (and subsequent trade) as a tool for social welfare improvements.

At the same time, social policies (including poverty reduction) were seen among most relevant factors for national development in 2017 (mentioned by 49% of respondents). Integration *per se* (mentioned by 25% of respondents) was ranked well behind a variety of different categories defined as relevant, such as: environment (48%), infrastructure (40%), public institutions (34%), rule of law (38%), gender equality (34%), equal opportunities

(46%), productivity (37%) and human capital (27%). This can suggest that integration is not perceived as a (practical?) goal in itself but probably rather broadly contextualised, perceived as a positive process, somehow contributing to social progress. Interestingly, people do appreciate successful integration *implicite*, recognizing the importance of its components, to mention only physical infrastructure, public institutions and rule of law among them. That goes in line with 66% of regional inhabitants declaring themselves as dissatisfied with their national institutions, which also occurs with supranational ones.

When evaluating preferences in terms of which regions were seen as more important for deepening economic integration, it should be highlighted that the United States was named by 34% of the respondents, while Latin America as a region ranked close to the European Union, China and Japan (all of these ranging from 11% to 16%). The relative unimportance of the home region can be explained by the current lack of maturity in on-going integration initiatives (together with the existence of multilateral agreements), resulting in diminished effects and overall efficiency. On the other hand, the prevalence of the United States as the identified relevant economic integration partner can be associated with the positive views on the effects of incoming foreign investment flows, which is supported by 67% of the population (with only 12% against it), and this view has not changed since 1995, where 69% of the surveyed identified direct incoming investing flows as positive.

For 1995 and 2000, 19% and 16% of the surveyed had pessimistic views over whether strong integration ties (i.e. regional common economic areas) could be a realistic goal of their governments' activities that would have been conducted by 2005, while 53% and 50%, respectively, were positive on that outcome. Two decades later, when asked about it in 2017, 28% of the population strongly acknowledged their national governments' efforts towards regional integration, 32% considered that little to no efforts had been implemented within the last five years, which helps to illustrate the perceived stagnated current state affairs and limited trust of the public in the governments' abilities to achieve fuller integration.

The relevance of trade as a key driver of economic integration remains an important topic of public discussion. For example, despite its limitations, Mercosur was identified by the general population of Argentina, Bolivia, Brazil, Chile, Paraguay, Uruguay and Venezuela as a top multilateral organisation providing the biggest benefits for its member societies. Mercosur is also identified as the most relevant institution fostering economic development by the inhabitants of Mercosur countries, being named by 29% of respondents as crucial for development over an average response of 25% for integration as a whole.

As such, it can be said that there is demand for regional integration in Latin America and although there has been some progress, it is an incomplete process with differentiated results between countries. This phenomenon can be measured in Latinobarómetro's 'Integrometer', which is an indicator created by the Latinobarómetro NGO aiming to present a metric which measures dissatisfied demand for regional integration by quantifying it as the intersection of those respondents strongly in favour of integration while at the same time dissatisfied by their national governments' efforts (or priorities) towards integration. Basco (2017) refers to the Integrometer, highlighting that for 2017 the Latin American region metric showed an average of 7.3%, more importantly, when exploring the relative metrics for South American countries, it is possible to identify that those having larger figures (i.e. Venezuela with 20.8%, Argentina with 11.5% and Paraguay with 9.8%), share comparatively

more inefficient institutions, increased restrictions on personal freedoms, and tighter restrictions over people and capital mobility; while those with lower figures (i.e. Chile with 3.2%, Ecuador with 3.3% and Brazil with 3.7%) tend to present higher foreign trade involvement, more efficient structures, and in the Brazilian case, major size advantage. This approach allows to identify regional dynamics, while also individual advances.

To sum it up, incomplete implementation of economic integration, which is Mercosur's case, seems to be rather disappointing for the Latin American public opinion. It is also true that coexisting trade agreements are very heterogonous in their original nature. They have emerged from very different political perspectives, some initiated decades ago to concentrate on priorities that may seem a bit 'old fashioned' and fatigued now, while others were brought to life to highlight the pro-integration profile of the region, which continues to solidify despite its limitations and lack of speedy progress. Remarkably, *vox populi* sounds more determined and inclined to follow the economic integration path than the policy-makers' deeds. Therefore, it is quite reasonable to assume that the expert opinions could be better targeted, i.e. addressed to the latter to shed more light on economic integration, and in particular (updated) FTA anticipated results. That would, hopefully, improve social dialogue between citizens and the government, and lead to further steps in shaping a relevant economic integration model. But then again another question arises, how does 'the expert voice' sound. Is it coherent, comprehensible, and strong enough?

## MATERIAL AND METHODS

### Expert Opinion Database in the Spanish Language

To reflect the Spanish language 'expert opinions' concerning FTA we created a database consisting of 185 documents, which in principle included two main publishing categories:

- Spanish language research papers published in academic journals identified through international digital libraries and search resources[5], as well as Chilean-based university repositories[6] (mostly located in the area of economics, but also social and political sciences).
- Economic reports or publications by Chilean-based think tanks[7] with regional scope, supranational organisations[8] and Chilean government bodies or agencies[9].

Relevant key-words were applied (in Spanish): *tratado de libre comercio* (free trade agreement), *acuerdo de libre comercio* (free trade agreement), *acuerdo de complementación económica* (economic complementary agreement), *acuerdo de asociación económica* (economic association agreement), *Mercosur*, *Acuerdo Transpacífico de Cooperación Económica*

[5] International: Jstor, ProQuest, EBSCO, RePEc and Google Scholar.

[6] The search incorporated the digital libraries from the three highest ranked Chilean universities (i.e. Universidad de Chile, Pontificia Universidad Católica de Chile, and Universidad de Concepción) as per CWTS Leiden Ranking and Webometrics.

[7] 2016 Global Go To Think Tank Index Report by the University of Pennsylvania was employed to identify the highest ranked Chilean-based think tanks. The selected organisations were Centro de Estudios Públicos, Libertad y Desarrollo, Fundación para el Progreso, Fundación Jaime Guzmán, Fundación Chile 21, Comisión Económica para América Latina CEPAL and Corporación de Estudios para Latinoamerica.

[8] The United Nations Conference on Trade and Development (UNCTAD) and the Organization for Economic Cooperation and Development (OECD).

[9] Dirección General de Relaciones Económicas Internacionales (DIRECON), ProChile and Banco Central de Chile.

(Transpacific Partnership), *Alianza del Pacífico* (Pacific Alliance), *comercio* (trade) and combined with the words: *efecto* (effect), *impacto* (impact), *análisis* (analysis), *gravedad* (gravity), *equilibrio* (equilibrium), and *modelo* (model).

Following this step, only documents published in the period between 2011 and 2017 were collected. In this way we obtained a literature sample that gave an updated post-crisis perspective.

The database contains theoretical papers as well as works based on qualitative review, statistical analysis of economic and trade data, and reports prepared by supranational and Chilean agencies or think tanks. There are also research papers counted in, which are mainly model-based empirical studies aimed at possibly precise evaluation of FTA impact. The latter category constitutes only 8% of the total database content. Well-recognised FTAs like Mercosur and PA are often discussed in the papers we explored. However, various (predominantly smaller scale) either bilateral or multilateral agreements are more popular subject areas than those bigger and better recognised (Table 2).

**Table 2. Core agreement focus in Spanish language database**

| Agreement | Percentage |
|---|---|
| Mercosur | 20% |
| Pacific Alliance | 19% |
| Trans Pacific Partnership (TTP) | 3% |
| Bilateral or multilateral agreements | 44% |
| Other[10] | 13% |

Source: own study.

The papers that contain strictly quantitative approach are in minority. Only historical papers are rarer.

**Table 3. Main analytical objectives in the Spanish language database**

| Objective | Percentage |
|---|---|
| Measuring or commenting on the impact on the economy or society | 63% |
| Commenting on political considerations, challenges and limitations for the agreements | 24% |
| Providing historical background or evolution of the multiple FTAs or integration initiatives | 5% |
| Empirical papers measuring impact of trade agreements on trade related measures | 8% |

Source: own study.

In our meta-analysis we relied exclusively on empirical papers that had well-specified gravity equations, and provided us with point estimates for coefficients along with its standard error or variance. The subset of the selected papers that met the criteria (Table 4).

[10] UNASUR, Andean Community of Nations, ALBA, NAFTA, Transatlantic Trade and Investment Partnership.

**Table 4. Empirical research identified in the Spanish language database**

| Author | Date | Topic | Methodology |
|---|---|---|---|
| De Cicco, Cala, Berges | 2011 | Determinants of Argentinean trade | Gravity equation estimated using panel data to evaluate trade determinants in Argentina using data between 1992 and 2007 for Argentina and 26 other countries |
| Avila | 2017 | Determinants of foreign trade in Colombia – Partners | Gravity equation estimated using panel data to evaluate export determinants between 2000 and 2015 for Colombia and main trade partners (49 countries in total) |
| Bolívar Caro, Cruz García, Pinto Torres | 2015 | Determinants of foreign trade in Colombia – Partners | Gravity equation estimated using panel data to evaluate trade determinants between 1991 and 2012 for Colombia and 173 countries |
| Morales Rivas, Duarte, Marcia | 2015 | Impact of Nicaragua's FTAs in exports | Gravity equation estimated using panel data to evaluate export determinants between 1994 and 2013 for Nicaragua and main trade partners |
| Riera Duarte | 2016 | Impact of Chile-Mercosur FTA in Chile's trade | Gravity equation estimated using panel data to evaluate export determinants between 1990 and 2015 for Chile, Mercosur and other countries (181 countries in total) |
| Vásquez Gonzalez, Cabas Monje | 2012 | Impact of FTAs on Chilean exports | Gravity equation estimated using panel data to evaluate trade determinants for Chile and OECD countries |
| Díaz Valencia | 2016 | Impact of FTAs on Colombia exports | Gravity equation estimated using panel data to evaluate agricultural import determinants for Colombia between 1990 and 2013 (Colombia and the United States) |
| Rosales, Gutierrez | 2016 | Impact of FTA on Venezuela-Colombia trade | Gravity equation estimated using panel data to evaluate trade determinants between Colombia and Venezuela using data between 1995 and 2013 |

Source: own study.

## METHODOLOGY

In order to analyse the impact of free trade agreements (FTA), meta-analysis of the results of the research into this subject was performed using the sample of eight Spanish Language papers. A detailed description of each research is depicted in Table 5. In our research we included models in which natural logarithm of some measure of trade was regressed on the FTA dummy variable along with other explanatory variables. Regressand is expressed in terms of natural logarithms, and concerns imports, exports intra-industry trade or trade as a whole. Due to that construction of the models if the estimated coefficient is $\beta$, countries with FTA memberships experience on average $(e^{\beta} - 1) * 100$ percent more trade than countries outside the free trade area (Halvorsen & Palmquist, 1980). Still two points need to be made about this interpretation. A positive value of the coefficient does not unequivocally testify to trade creation of FTAs, as the additional trade can be a consequence of trade diversion. Secondly, this measure suffers from endogeneity issue, because a priori one can expect that countries that trade with one another a lot are more likely to establish a free trade association. The estimation strategy follows (Viechtbauer, 2010).

In meta-analysis values of the point estimate for the FTA dummy variables were considered along with their respective standard errors. We assume that for i = 1, 2, …, k independent point estimates:

$$y_i = \theta + u_i \,, \tag{1}$$

where:

$y_i$ - denotes the observed point estimate;
$\theta$ - is the true value of the point estimate;
$u_i$ - is the sampling error, and $u_i \sim N(0, \sigma_i^2)$.

Under this assumption, the obtained coefficients are unbiased and normally distributed estimates of the true effect of FTA on trade. $\sigma_i^2$ – the sampling variances are assumed to be known.

Of course, in each of the bodies of research presented in tables, a different methodology was used – estimation method, set of control variables – as well as the analysed sample of countries and time period. This introduces heterogeneity (variability) among the true values of the regression coefficients. There are several ways one can deal with this problem. Firstly, random effects model can be applied, which is given by:

$$\theta_i = \mu + v_i \,, \tag{2}$$

where:

$v_i \sim N(0, \tau^2)$ - in such a model structure, the true coefficient is assumed to be normally distributed with mean $\mu$ and variance $\tau^2$(Viechtbauer, 2010);
$\mu$ - is the value of the true coefficient;
$\tau^2$ - measures the total heterogeneity among the true coefficients – with $\tau^2 = 0$ implying homogeneity.

Both random effects model provides an unconditional inference about the true value of the coefficient under consideration (Hedges & Vevea, 1998). The k studies included in the meta-analysis are treated as a random sample taken from a hypothetical population of studies that were conducted, will be conducted or might have been conducted. So inferences taken from random and mixed effects models consider the average coefficient from the population from which studies under consideration are a random sample.

On the other hand, fixed effects models provide conditional inference, about the k research under consideration in the meta-analysis (Hedges & Vevea, 1998). In other words, a fixed effects model is helpful in assessing the value of the true coefficient under consideration in the k studies included in the analysis. A Fixed effects model can be applied with unweighted least squares as:

$$\bar{\theta}_u = \frac{\sum_{i=1}^{k} \theta_i}{k}, \tag{3}$$

where:

$\bar{\theta}_u$ - is a simple average of true effects (Laird & Mosteller, 1990). Weighted least squares estimates are given by:

$$\bar{\theta}_w = \frac{\sum_{i=1}^{k} w_i \theta_i}{w_i}, \tag{4}$$

with weights given by $w_i = 1/v_i$.

**Table 5. Studies used in meta-analysis**

| Authors (year) | Estimated coefficient | Standard error | Method | Period | Sample of countries | Dependent variable | Control variables |
|---|---|---|---|---|---|---|---|
| De Cicco, Cala, & Berges (2011) | -0.351 | 0.155 | GLS, random effects | 1992-2007 | 28 developed and developing countries | Intra-industry trade | Gravity variables, cultural similarity, GDP differential, HDI differential, GDP per capita, GDP per capita differential |
| Avila (2017) | 0.96111 | 0.14757 | Panel corrected standard errors | 2000-2015 | 49 developed and developing countries | Exports | GDP differential, common language, |
| | 1.043884 | 0.192278 | Pooled OLS | | | | |
| | 1.039231 | 0.6465436 | Random Effects OLS | | | | |
| Bolívar Caro, Cruz García, & Pinto Torres (2015) | 0.848 | 0.099 | Pooled OLS | 1991-2012 | 173 Countries | Trade | Area, common language, common border, coastline, island, colonial ties, the same nation, common currency, WTO, trade preferences, oil prices |
| | 1.473 | 0.278 | Random Effects OLS | | | | |
| Morales Rivas, Duarte, & Marcia (2015) | 13.2511 | 4.62723 | Fixed Effects OLS | 1994-2013 | 15 South American countries | Exports | Gravity variables |
| | 6.79976 | 1.89074 | | | | | |
| | 6.06909 | 2.22592 | | | | | |
| | 10.3576 | 3.14054 | | | | | |
| Riera Duarte (2016) | -0.4307603 | 0.1173431 | Pooled OLS | 1990-2015 | 181 countries | Exports | Land, isolation level, coast, common border, common language |
| Vásquez Gonzalez & Cabas Monje (2012) | 0.8952 | 0.0489 | FGLS | 1960-2010 | OECD countries | Trade | GDP per capita, common language |
| Díaz Valencia (2016) | -6.471 | 30.848 | Pooled OLS | 1990-2013 | Colombia, United States | Imports | Output, tariffs |
| Rosales & Gutierrez (2016) | 0.25 | 0.13 | Pooled OLS | 1995-2013 | MERCOSUR countries | Trade | Gravity variables, common language, common border |

Source: own study.

The random effects models were fitted using a two stage approach (Raudenbush, 2009). In the first stage residual heterogeneity was estimated using one of the following estimators: the Hunter-Schmidt estimator (Hunter & Schmidt, 2004) – 'HS', the Hedges estimator (Hedges & Olkin, 1985; Raudenbush, 2009) – 'HE', the DerSimonian-Laird estimator (DerSimonian & Laird, 1986; Raudenbush, 2009) – 'DL', the Sidik-Jonkman estimator

(Sidik & Jonkman, 2005a; 2005b) – 'SJ', the maximum-likelihood – 'ML' – and restricted maximum-likelihood estimator (Viechtbauer, 2005; Raudenbush, 2009) – 'REML', and the empirical Bayes estimator (Morris, 1983; Berkey *et al*., 1995) – 'EB'. In the second stage $\mu$, $\beta_0, \beta_1, \dots, \beta_7$ were estimated using weighted least squares with weights $w_i = 1/(v_i + \widehat{\tau^2})$, where $\widehat{\tau^2}$ is the estimate of $\tau^2$. Later on, the null hypothesis of $\tau^2$=0 for random effects models was tested using Cochran's Q-test (Hedges & Olkin, 1985).

Two sessions of estimations were run. In the first one, all models from all the articles were taken as a sample – in that instance, k amounted to 14 observations. In the second one the author's preferred models were chosen, and in this case, k is given by eight observations. All the calculations were performed using the metafor package for R (Viechtbauer, 2010).

## RESULTS AND DISCUSSION

Meta-analysis for all the Spanish language studies was conducted at the study level and at the model level. This amounted to fourteen different models, and eight different studies. The models chosen for the study level were the ones preferred by the authors of the article. Firstly, we present the results at the model level. The results of the random effects models are reported in Table 6.

It turns out that no matter which estimator is utilised the values of the obtained parameters are positive and statistically different from zero at 0.05 level. Values of the estimated parameters range from 0.692 for the Hedges estimator to 2.309 for the Sidik-Jonkman estimator. This suggests that the FTA members trade with each other more by from 111 to 906 percent. The dispersion between the results is very wide, yet still it provides strong evidence supporting the hypothesis that FTAs are facilitating trade very effectively. Still based on the data at hand, one cannot say whether this effect can be attributed to the trade creation or the trade diversion effect. The Cochrane Q-test shows that the hypothesis of homogeneity in true effects can be rejected at any conventional level.

**Table 6. Results of random effects estimation for 14 models**

| Estimator | HS | HE | DL | SJ | ML | REML | EB | MAX | MIN |
|---|---|---|---|---|---|---|---|---|---|
| θ | 0.748 | 0.692 | 0.807 | 2.309 | 0.864 | 0.936 | 2.129 | 2.309 | 0.692 |
| se(θ) | 0.172 | 0.036 | 0.205 | 1.053 | 0.235 | 0.271 | 0.903 | 1.053 | 0.036 |
| z | 4.351 | 19.362 | 3.939 | 2.192 | 3.673 | 3.447 | 2.358 | 19.362 | 2.192 |
| p | 0.000 | 0.000 | 0.000 | 0.028 | 0.000 | 0.001 | 0.018 | 0.028 | 0.000 |
| 95%low | 0.411 | 0.622 | 0.405 | 0.244 | 0.403 | 0.404 | 0.360 | 0.622 | 0.244 |
| 95%upp | 1.085 | 0.762 | 1.208 | 4.373 | 1.325 | 1.467 | 3.899 | 4.373 | 0.762 |
| τ^2 | 0.229 | 0.000 | 0.340 | 12.642 | 0.464 | 0.638 | 9.031 | 12.642 | 0.000 |
| τ | 0.478 | 0.000 | 0.583 | 3.556 | 0.681 | 0.799 | 3.005 | 3.556 | 0.000 |
| I^2 | 90.28% | 0.00% | 93.23% | 99.81% | 94.97% | 96.29% | 99.73% | 99.8% | 0.0% |
| H^2 | 10.290 | 1.000 | 14.840 | 514.980 | 19.870 | 26.940 | 368.160 | 515.0 | 1.000 |
| Q | 192.885 | | | | | | | | |
| p(Q) | 0.000 | | | | | | | | |

Source: own study.

The results of the fixed effects model are shown in Table 7. The coefficient obtained using weighted least squares is equal to 0.69 and is highly statistically significant. The coefficient

obtained with unweighted least squares amounts to 2.575 and it is not statistically significant at any conventional level. As the fixed effects model with unweighted least squares is nothing more than a plane average, this result paints rather a distinctive picture of an impact of FTA on trade in the Spanish language literature. On one hand, the random effects model shows that the true effect of FTA on trade is positive and highly significant. On the other, results presented in the literature are not so unequivocal, as they present both positive and negative point estimates, and in some studies, they are reported as not significant.

**Table 7. Results of fixed effects estimation at the model and the study level**

| LEVEL | Model | | Study | |
|---|---|---|---|---|
| **Method** | **Weighted** | **Unweighted** | **Weighted** | **Unweighted** |
| θ | 0.692 | 2.5751 | 0.659 | 1.159 |
| se(θ) | 0.036 | 2.2497 | 0.037 | 3.899 |
| z | 19.362 | 1.145 | 17.932 | 0.297 |
| p | 0.000 | 0.252 | 0.000 | 0.766 |
| 95%low | 0.622 | -1.834 | 0.587 | -6.484 |
| 95%upp | 0.762 | 6.985 | 0.731 | 8.801 |
| Q | 192.885 | | 154.825 | |
| p(Q) | 0.000 | | 0.000 | |

Source: own study.

Now we turn to the study level. The results for the random effects model are shown in Table 8. Here all estimated values of the FTA dummy parameter are positive, yet their significance relies upon the application of the particular estimator. Under the Sidik-Jonkman, as well as the empirical Bayes estimator the value of the parameter is not different from zero at any conventional level. At the study level, the true effect ranges from 0.442 for the Hunter-Schmidt estimator to 1.138 for the Sidik-Jonkman estimator. This implies that the countries inside the FTA on average trade by 56 to 211 percent more than countries outside these agreements. The Q rejects the null hypothesis of homogeneity at any conventional level.

**Table 8. Results of random effects estimation for 8 preferred models**

| Estimator | HS | HE | DL | SJ | ML | REML | EB | MAX | MIN |
|---|---|---|---|---|---|---|---|---|---|
| θ | 0.748 | 0.692 | 0.807 | 2.309 | 0.864 | 0.936 | 2.129 | 2.309 | 0.692 |
| se(θ) | 0.172 | 0.036 | 0.205 | 1.053 | 0.235 | 0.271 | 0.903 | 1.053 | 0.036 |
| z | 4.351 | 19.362 | 3.939 | 2.192 | 3.673 | 3.447 | 2.358 | 19.362 | 2.192 |
| p | 0.000 | 0.000 | 0.000 | 0.028 | 0.000 | 0.001 | 0.018 | 0.028 | 0.000 |
| 95%low | 0.411 | 0.622 | 0.405 | 0.244 | 0.403 | 0.404 | 0.360 | 0.622 | 0.244 |
| 95%upp | 1.085 | 0.762 | 1.208 | 4.373 | 1.325 | 1.467 | 3.899 | 4.373 | 0.762 |
| τ^2 | 0.229 | 0.000 | 0.340 | 12.642 | 0.464 | 0.638 | 9.031 | 12.642 | 0.000 |
| τ | 0.478 | 0.000 | 0.583 | 3.556 | 0.681 | 0.799 | 3.005 | 3.556 | 0.000 |
| I^2 | 90.28% | 0.00% | 93.23% | 99.81% | 94.97% | 96.29% | 99.73% | 99.8% | 0.0% |
| H^2 | 10.290 | 1.000 | 14.840 | 514.980 | 19.870 | 26.940 | 368.160 | 515.0 | 1.000 |
| Q | 192.885 | | | | | | | | |
| p(Q) | 0.000 | | | | | | | | |

Source: own study.

Table 7 contains estimates obtained at the study level for the fixed effects models. Here the conclusion is also similar to those attained at the model level. In both cases the effect is positive, but significant only in the case of weighted least squares. One more time comparing results from fixed and random effects models shows that even though the true effect is positive and significant, the same cannot be said about the overall picture of the research into the impact of FTA on trade in the Spanish language literature.

Summarizing, the Spanish language literature gives a lot of the support to the notion that free trade agreements are associated with higher trade. Of course, due to the measure of the FTA participation considered in the present meta-analysis, the exact size effect can be brought to question. As mentioned before, with FTA dummy variable increased traded can have its sources both in trade creation and trade diversion. Also, endogeneity issue might result in overestimation of the effect, as countries that trade more are more likely to establish free trade agreements. Having this in mind, random effects models show that the underlying true effect of the participation in FTA is both positive and significant. Weighted least squares fixed effects models at both the study and the model level support this notion. Unweighted least squares models for Spanish language papers are the only ones where the positive effect of FTA is not statistically significant. Still, the analysis shows that the bulk of research brings a lot of support to the notion that FTA brings about higher trade.

## CONCLUSIONS

Regional public opinion seems to be quite supportive for FTA and economic integration over the last two decades displaying an on-going pro-integration profile. Some dissatisfaction concerning inadequate policy measures aimed at increasing and enhancing integration processes can be captured in Latinobarómetro results, this is derived from policy design inconsistencies, and inefficiency in application due to diverging political realities with multiple degrees of institutional maturity, rather than critique over integration per se. Expert opinions could be quite valuable as policy guidelines. However, our Spanish language database containing expert materials has limited quantitative content that would provide policy-makers and citizens with estimations of specific FTA effects. Meta-analysis of the selected papers that meet the necessary criteria confirms positive FTA effects, which can be used as a convincing argument for further integration in South America, although more research in this area could strengthen its value as a policy support tool while simultaneously continuing to solidify the pro-integration views of the public through the facilitation of expert knowledge transfer towards the public, particularly by delivering quantifiable expected benefits. Ultimately, this would serve to align policy-makers and perspectives of society.

The main limitation of the research concerns measures of trade integration used in the research. Research utilizing meta-analysis requires comparable statistics to draw conclusions concerning examined phenomena. The requirement of comparability imposed the choice of binary variable representing participation in free trade area that is most commonly used in FTA research. At the same time the use of the variable is associated with the issues described in the methodological section. The future research should involve more comprehensive measures of the effects of participation in free trade area on growth of international trade flows.

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## Authors

The contribution share of authors is equal and amounted to 33.33% each of them.

**Krzysztof Beck**

Assistant Professor, director of the Econometrics Department. Graduated from Cracow University of Economics and received PhD degree in Economics at Faculty of International Business and Economics at Poznan University of Business and Economics. A recipient of an award in the Central Statistical Office of Poland's competition for the best doctoral dissertation in Statistics. Since 2014, has been the head of Applied Economics Institute at Lazarski University in Warsaw. A lecturer on English-language double degree studies accredited by Coventry University. His main interests include: international economics, international business cycles, international trade, currency unions, macroeconomics, econometrics, applied econometrics, mathematical economics, bayesian statistics, and programming.

**Correspondence to:** Dr. Krzysztof Beck, Lazarski University in Warsaw, ul Świeradowska 43, 02-662 Warszawa, Poland, e-mail: beckkrzysztof@gmail.com

**ORCID** http://orcid.org/0000-0003-3679-2962

**Bogna Gawrońska-Nowak**

Associate Professor. Graduated from the University of Lodz, Coimbra University, Erasmus University in Rotterdam and London School of Economics. She did her PhD in Economics at Faculty of Economics and Sociology at the University of Lodz and her habilitation at the Faculty of International Business and Economics at Poznan University of Business and Economics. Since 2009, she has been the head of Department of Economics at Lazarski University in Warsaw. She is a lecturer on English-language double degree studies accredited by Coventry University.

**Correspondence to:** Prof. UŁa, dr hab. Bogna Gawronska-Nowak, Lazarski University in Warsaw, ul Świeradowska 43, 02-662 Warszawa, Poland, e-mail: b.gawronska@lazarski.edu.pl

**ORCID** http://orcid.org/0000-0003-3651-7637

**Paul Valdivieso**

A business economist and a consultant. Graduated from Andrés Bello Catholic University, University of Wales and Warsaw University of Technology Business School. He completed his PhD in Economics at Kozminski University in Warsaw. At present, he works in an international consulting firm, advising multinational groups with the financial planning of cross-border intra-group transactions. He worked at the Department of Economics at Lazarski University in Warsaw as a lecturer, and currently is a member of the Institute of Socio-Economic Enquiry in Warsaw and acts as a master's thesis supervisor within the Faculty of Economics and Business at University of Chile in Santiago. He has published articles in international and financial economics as well as strategic management.

**Correspondence to:** Dr. Paul Valdivieso, ISEE Instyt Społeczno-Ekonomicznych Ekspertyz w Warszawie, ul. Mickiewicza 74 lok. 74, 01-650 Warszawa, Poland, e-mail: pvaldg@gmail.com

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# Shadow Economy and its Impact on Demand at the Investment Market of the Country

**Yuriy Bilan, Tatiana Vasylieva, Sergij Lyeonov, Inna Tiutiunyk**

**ABSTRACT**

**Objective:** The objective of the research is to study the link between drivers of the shadow economy and the demand level on the investment market.

**Research Design & Methods:** Based on the Shapiro-Wilk test, the normality of capital investment distribution and the shadow economy level of the European Union countries and Ukraine are evaluated. Spearman and Shapiro-Wilk tests are used to identify the most relevant indicators of impact.

**Findings:** The analysis of the changing dynamics regarding the capital investment volume and the shadow economy level in Ukraine and the EU countries during 2010-2016 shows that there is an inverse link between them – the growth of the shadow economy has a negative impact on the capital investment volume in the country.

**Implications & Recommendations:** This research proves significant influence of the shadow economy on the demand level on the investment market and underlines the necessity to review the current state policy to stimulate the demand on the investment market from the viewpoint of the most relevant shadow drivers.

**Contribution & Value Added:** The scientific contribution of the article is that existing research on the impact of shadow economy on the economic development of countries remains fragmented, as well as studies assessing its effect on a country's investment attractiveness. The constructed econometric model may provide some insight into better understanding of the most influential factors affecting a country's investment attractiveness and the immediate response to it.

**Article type:** research article

**Keywords:** shadow economy; investment activities; money laundering; legalisation; corruption

**JEL codes:** F63, G17, H3,K220

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## INTRODUCTION

Under conditions of the financial resources deficit, internal and external investments are significant tools to fasten rates of economic growth and to create a possibility to move to the qualitatively new level of a country's development (Skare & Porada-Rochoń, 2019).

Specialists of the United Nations Conference on Trade and Development define an increase in the foreign direct investment (FDI) volumes and qualitative transformation of their flows as a key dominant to achieve Millennium Development Goals. Such goals have an obvious social and economic focus, so that is why today the important task for governments of all countries is to set a clear and stable relationship in the investing sphere.

Investments are observed as factors of the technical and technological production renovation, structural shifts in the national economy, an increase in the economic qualitative indicators at the micro and macro levels, a guarantee of a country's macroeconomic stability (Rahimi, 2016; Damoska Sekuloska, 2018; Nazarczuk & Krajewska, 2018; Do & Park, 2018; Špička, 2018). The formation of the country's favorable investment environment, being under the influence of external and internal factors, is considered to be the basis for investment attractiveness of any country (Cheba & Szopik-Depczyńska, 2017). One of the biggest destructive factors is the shadow economy (Al-Sadig, 200; Blajer-Gołębiewska & Kos, 2016; Bobenič Hintošová *et al*., 2018; Kostyuchenko *et al*., 2018; Leonov *et al*., 2014; 2018; Vasilyeva, 2013, 2016, 2018).

According to United Nations Office on Drugs and Crime (2018), the annual amount of money laundering is equal to 2-5% of the world GDP and is said to cause a significant impact on the economic development indicators of a country. It is observed by investors as one of the main threats to effective capital investment.

Thus, the performed analysis shows that there is a great changeability and instability of the FDI volumes in the majority of the analysed countries and updates the necessity to define the most significant factors of impact on them.

Therefore, the main objective of the article is to measure the impact made by some drivers of the shadow economy (SE) on the investment activity in Ukraine and the EU countries. While identifying them, we use statistical methods such as the Shapiro-Wilk test, Spearman's rank correlation, econometric modelling.

The remainder of the article is arranged as follows. In the second section, we analyse the current studies of the shadow economy impact on investment activity in a country. In the third section the shadow economy drivers which have the greatest impact on the demand level at the country's FDI are analysed. In the fourth section, we present a correlation analysis between the volume of capital investment and selected variables. Based on the set dependencies, a mathematic model is built. In section 5, we present our conclusions and suggestions for further research.

## LITERATURE REVIEW

The degree of the interrelation between the shadow economy and a country's investment attractiveness has been actively studied by representatives of the world countries' international economic community. The available theoretical and empirical studies have not provided an unambiguous answer to this problem. One of the reasons for such a situation

is the fact that the susceptibility level of a country's investment development indicators from the shadow economy level is defined not only by the objective reasons of their interrelation but also by the economic development stability, the economic security level, investment potential, the existence of an economic or political crisis in the country. On the other hand, there are many scientific works which deal with the determinants of the shadow economy, the correlation level evaluation between general indicators of the shadow economy and direct foreign investment volume. However, nowadays, there are not detailed investigations of the impact made by separate factors of the shadow economy on the investment level and identification of the most influential ones.

**Determinants of Shadow Economy**

The scientific literature has a great variety of approaches to identify the most influential determinants of the shadow economy, which differ with the impact factors and results of their action degree and directions assessment.

Many authors (Sookram *et al*., 2009; Williams, & Nadin, 2012) studied the shadow economy in terms of its relationship with the labour market. According to Wiseman (2013), employment problems in the country, high level of unemployment become the reasons for an increase in informal employment. While studying the labour market in Poland, Cichocki and Tyrowicz (2010) made conclusions that on the one hand, the shadow economy factors are taxation disorders at the official labour market, and on the other hand, the absence of the demand for some professions on the official market.

Another factor, observed in terms of the influence in the shadow economy, is the confidence level in the government and good governance. Teobaldelli and Schneider (2013), Ipatov *et al*. (2018) confirmed that countries where the fiscal regulation of the economy is carried out on a democratic base, had lower shadow economy.

Based on the examples of foreign experience, Krumplyte (2008) demonstrates that countries with a high tax burden (52-55%) are more competitive and have a small amount of the shadow economy (Sweden, Denmark, Finland). Countries with a relatively low tax burden (up to 20%) have the shadow economy of over 60% of GDP (Georgia, Mexico).

In general, for most industrial countries the following factors influence the level of the shadow economy (Enste, 2015): tax burden and excessive contributions of social insurance; frequency and intensity of the regulation of officially recorded economy, extremely strict regulation of the labour market with untimely retirement, growing unemployment rate and limitation of possible work hours per week, which define the search of illegal jobs. Usually, countries with a high level of the shadow economy demonstrate a low level of being ready to pay taxes, defined by corruption, tolerance of the state, and low respect and loyalty to public organisations. Analysing the countries of the Central and Eastern Europe, including the Baltic states, scientists (Schneider, 2007) point to other reasons which specify the shadow economy: incompetence of official institutions (legal acts, bureaucracy, judicial practice); corruption which undermines the confidence in government; weak realisation of legislation, impossibility or unwillingness to protect the property rights; high expenses for business development and burden on business administration; low probability of the fact that it is possible to avoid it if one avoids paying taxes or doing illegal work; extremely high bureaucracy.

The level of the shadow economy in Lithuania during 2000-2011 is explained by such factors as labour power velocity, the volume of the international trade, the private sector

crediting and business freedom index. In Estonia and Lithuania, the limitations of the private sector credit are determinant factors which influence the scales of the shadow economy.

**Drivers of Shadow Economy and Investment Activities**

There are various empirical studies on the link between separate elements in the shadow economy and the investment activities. Some of them have argued that the shadow economy impeded the investment growth. However, there are a lot of studies identifying the shadow economy as an important determinant of the FDI attracted by a country (Wei, 2000; Cleeve, 2008; Al-Sadig, 2007; Asiedu, 2006; Morrissey *et al*., 2012; Omidie *et al*., 2017, Formankova *et al.*, 2018; Nunes *et al*., 2017).

According to the first hypothesis, the shadow economy negatively affects the level of social and economic development of a country, distorts the indicators of official statistics and therefore would lead to ineffective macroeconomic policy. Abed and Davoodi (2002) study a negative impact of the shadow economy on the FDI for 24 transition countries.

The similar results of the negative influence, made by corruption, on total FDI in Eastern Europe and the former Soviet Union are provided by Smarzynska and Wei (2000). Lambsdorff and Cornelius (2000) investigated the negative impact of the shadow economy on FDI for the African countries. They found that corruption deterred FDI more than local investments.

On the other hand, the shadow economy is characterised by a range of positive effects on investment activity in a country. Based on the data of 73 countries, Egger and Winner (2005) made a conclusion that foreign companies being interested in making FDI might use various channels of money laundering, corruption schemes in order to receive special conditions.

Abror (2015) analysed the regional effect of shadow economies on FDI for 40 countries divided into four groups (Europe, South & North America, Africa & Middle East, Asia & Oceania) over the period from 1999 to 2009 using a panel data method. He made a conclusion that the European countries have a statistically significant and negative relationship between the SE and FDI. South and North America countries have a statistically significant and positive relationship between them. Janicki (2004) concluded that the trade openness was the most important determinant of FDI for eight EU countries (Bulgaria, the Czech Republic, Estonia, Hungary, Poland, Slovakia, Slovenia, Romania) and Ukraine. The salary level had also a significant influence. The lower it was, the higher interest grew among foreign investors.

Riedl (2009) defined the flowing factors of influence on the direct foreign investments for new EU countries (The Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia): GDP, concentration of the industry and agglomeration had a positive impact, the salary level – negative. For such countries as the Czech Republic, Hungary, Poland, etc., Demirhan (2008) defined that trade openness positively influences FDI, inflation and tax rate – negatively.

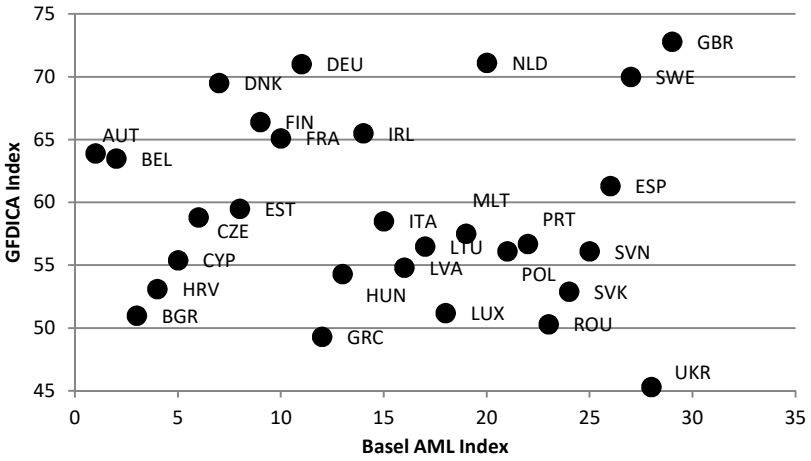
A great number of researchers suggests that FDI inflows in the developing economies favourably related to the openness to trade (Zdziarski, Światowiec-Szczepańska, Troilo, & Małys, 2017). Addison and Heshmati (2003) examined the impact of FDI in almost 50 developing countries using exports and imports as a percentage share of GDP. Their findings indicate that there is a positive and significant relationship between both of them.

Based on the analysis of the national currency exchange rate against the US dollar and direct foreign investments volume, Udomkerdmongkol *et al*. (2006) concluded that there was a positive significant relationship between them.

However, taking into account the above variety of impact of the shadow economy drivers on the investment attractiveness level in a country, provided by the differently directed level of their manifestation, by various time horizons, degree of consequences, formation of the mathematic model regarding the factorial features impact on the investment volumes in the country, can be an effective tool to identify the most influential factors and can be the criterion to make decisions while investigating the preventive measures oriented to increase demand and supply on the investment market.

## MATERIAL AND METHODS

The study regarding changes of the tendencies in the investment activity indicators in the country and shadow withdrawals of funds through comparison of the changing dynamics regarding Global Foreign Direct Investment Country Attractiveness (GFDICA) and Basel Anti-Money Laundering Index (BAMLI) for the EU countries and Ukraine during 2015-2018 is shown in Figure 1.




*AUT – Austria, BEL – Belgium, BUL – Bulgaria, HRV – Croatia, CYP – Cyprus, CZE – Czech Republic, DNK – Denmark, EST – Estonia, FIN – Finland, FRA – France, DEU – Germany, GRC – Greece, HUN – Hungary, IRL – Ireland, ITA – Italy, LVA – Latvia, LTU – Lithuania, LUX – Luxembourg, MLT – Malta, NLT – Netherlands, POL – Poland, PRT – Portugal, ROU – Romania, SVK – Slovak Republic, SVN – Slovenia, ESP – Spain, SWE – Sweden, UKR – Ukraine, GBR – United Kingdom*

**Figure 1. Comparison of the average GFDICA and BAMLI in the EU countries and Ukraine in 2015-2018**

Source: own elaboration based on the Global Foreign Direct Investment Country Attractiveness Index data available at http://www.fdiattractiveness.com/; International Centre for Asset Recovery data available at https://index.baselgovernance.org/

According to the results of the analysis, one can conclude that most EU countries have average indicators. Austria, Belgium, Denmark, Germany are characterised by the highest level of the investment attractiveness and low volumes of the shadow financial flows.

A number of countries, among which the United Kingdom, Sweden, Netherlands have high indicators of the investment attractiveness and the worst indicators of Basel AML Index among the analysed countries. Ukraine, as only one country, which is not in the EU, has the worst analysed indicators.

Based on the above related literature, in this article we study the degree and nature (positive or negative) of the impact, made by some factor indicators of the shadow economy, on the direct foreign investment level for highly developed countries (EU countries) and those, which try to join the EU (Ukraine).

First, we will analyse the basic static indicators characterising the stability of the analysed indicators – standard deviation, the maximum and minimum value (Table 1).

**Table 1. Descriptive statistics of the used variables in GDP and Money Laundering in the period from 2004 to 2016**

| Country | Descriptive statistics | FDI | ML | Country | Descriptive statistics | GDP | ML |
|---|---|---|---|---|---|---|---|
| Hungary | Mean | 7725.4 | 6108 | Bulgaria | Mean | 1976.4 | 2382 |
| | Std. Dev. | 27816.7 | 1586 | | Std. Dev. | 341.7 | 1326 |
| | Min | 20934 | 2593 | | Min | 1656 | 681 |
| | Max | 69816 | 8457 | | Max | 2707 | 5358 |
| Sweden | Mean | 6742.3 | 1688 | Estonia | Mean | 1270 | 1434 |
| | Std. Dev. | 11838.4 | 774 | | Std. Dev. | 960.6 | 227 |
| | Min | 8624 | 815 | | Min | 714 | 1190 |
| | Max | 32553 | 2725 | | Max | 2593 | 1921 |
| Germany | Mean | 65792.8 | 54605 | Ireland | Mean | 68775 | 5908 |
| | Std. Dev. | 23541.7 | 5992 | | Std. Dev. | 73211.4 | 2944 |
| | Min | 19778 | 44412 | | Min | 3436 | 1944 |
| | Max | 97481 | 62455 | | Max | 235356 | 9287 |
| France | Mean | 36116.2 | 43917 | Finland | Mean | 6956.5 | 453 |
| | Std. Dev. | 13510.9 | 5061 | | Std. Dev. | 8994.0 | 224 |
| | Min | 5810 | 37922 | | Min | 6008 | 235 |
| | Max | 47336 | 53464 | | Max | 17244 | 928 |
| Slovakia | Mean | 2619.1 | 939 | Romania | Mean | 3984.5 | 3545 |
| | Std. Dev. | 2181.7 | 200 | | Std. Dev. | 1212.6 | 974 |
| | Min | 362 | 633 | | Min | 2370 | 1958 |
| | Max | 5922 | 1268 | | Max | 6252 | 5284 |
| Greece | Mean | 2160.2 | 3836 | United Kingdom | Mean | 78711.3 | 7468 |
| | Std. Dev. | 1195.8 | 2034 | | Std. Dev. | 76658.1 | 697 |
| | Min | 534 | 2571 | | Min | 27012 | 6288 |
| | Max | 4022 | 9776 | | Max | 265811 | 8646 |
| Ukraine | Mean | 4563.3 | 12 306 | Poland | Mean | 13011.1 | 10 937 |
| | Std. Dev. | 2506.4 | 5258 | | Std. Dev. | 6917.9 | 6190 |
| | Min | 847 | 4 380 | | Min | 795 | 651 |
| | Max | 8175 | 21 001 | | Max | 19776 | 17 698 |

Source: own calculations in Stata 1 based on World Bank data available at http://databank.worldbank.org/data/

The results of the calculations, pointing to a significant variation of the analysed indicators by years and a significant degree of their deviation of the average value, are shown

in Table 1. The standard deviation indicator of the analysed countries is characterised by a substantial scope. Thus, if the value does not exceed 1000 for Bulgaria, Estonia according to the indicator of the foreign investment volume, for such countries as Germany, Ireland, United Kingdom, Hungary it exceeds 20000. The same situation is with the amounts of illegal money laundering abroad.

Within the framework of the research of the demand on the investment market, the regressive equation of dependence between resulting and factorial features can be shown as:

$$D(t) = d_0 \times \prod_i u_i^{d_i}(t - l_i) \quad (1)$$

where:

$D(t)$ - resulting feature of the econometric model, in t-period;
$d_0, d_1$ - parameters of the regression equation, which are constant values;
$u_i$ - thei-factorial feature of the multiplicative regression model;
$l_i$ - lag, which complies with the i-factorial feature of the model.

Based on the above analysis, we will study the impact made by the drivers of the shadow economy in terms of their following groups (Table 2).

**Table 2. Groups of drivers of the shadow economy**

| Group of SE drivers | Indicators |
|---|---|
| Tax system | a number of tax payments ($u_3$), the total tax burden on the business ($u_{17}$) (Melnyk, 2018); |
| Labour system | the citizens' incomes volume ($u_4$), the official level of unemployment ($u_6$) (Rausser *et al.,* 2018; Ipatov, 2018), real average salary ($u_7$) (Enste, 2015), level of the labour migration ($u_{14}$) (Greco, 2018); |
| The trade openness | level of import and export ($u_{15}$), the foregone earnings for export of goods and services ($u_{24}$) and payment for import ($u_{12}$) (Bilan *et al.*, 2017; 2018), which did not come, the volume of public debt ($u_{13}$), the unregistered outflow of funds (removal of financial resource) ($u_{23}$); |
| Banking system | weighted average interest rate by all interest-bearing tools ($u_1$), the interest rate for deposits (u9), interest rate for credits ($u_{10}$), level of the deposit outflow ($u_{16}$), number of the solvent banks ($u_{21}$), official exchange rate of UAH in relation to the Euro ($u_8$) (Fernandes, 2018); |
| Quality of state regulations | level of the legal system efficiency in the arbitrary regulation ($u_{22}$) (Djalilov, 2015; Ipatov *et al.*, 2018), index of corruption ($u_{20}$), level of inflation ($u_{19}$), ), the yield of government securities at the primary market ($u_2$); |
| Industry development | the quantity of the sold industrial production ($u_5$), the share of the profitable enterprises ($u_{18}$). |

Source: own study.

## RESULTS AND DISCUSSION

In order to confirm the hypothesis regarding the link between the shadow economy and FDI, we compare changing tendencies of the given indicators during 2010-2016.

The complex analysis of the proper statistic information and determination of the time gaps between the quantitative values of the analysed indicators provide the possibility to obtain the econometric model which is relevant to the real economic system. In order to define the correlation coefficients, let us evaluate the distribution normality of the varying

indicator via the Shapiro-Wilk test. The results of calculations, shown in Figure 2, demonstrate that most indicators have a normal distribution, however, some of them are not subordinated to the normal distribution law.

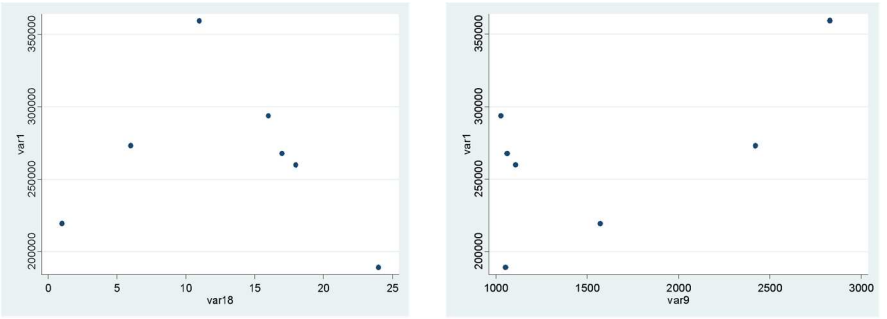



**Figure 2. Evaluation of the distribution normality of indicators by Shapiro-Wilk test**
Source: own calculations in Stata 12.

The results from the evaluation of distribution normality of the shadow economy drivers are given in Table 2.

**Table 2. Evaluation of distribution normality of the shadow economy drivers by Shapiro-Wilk test**

| Variable | Ukraine | | | | EU countries | | | |
|---|---|---|---|---|---|---|---|---|
| | W | V | Z | Prob>z | W | V | Z | Prob>z |
| Var1 | 0.964 | 0.472 | -1.048 | 0.853 | 0.945 | 0.463 | -1.027 | 0.836 |
| Var 2 | 0.944 | 0.781 | -0.385 | 0.650 | 0.916 | 0.758 | -0.373 | 0.631 |
| Var 3 | 0.794 | 2.868 | 1.964 | 0.025 | 0.842 | 3.040 | 2.082 | 0.066 |
| Var 4 | 0.870 | 1.817 | 1.040 | 0.149 | 0.904 | 1.890 | 1.082 | 0.155 |
| Var 5 | 0.934 | 0.917 | -0.137 | 0.555 | 0.990 | 0.972 | -0.145 | 0.588 |
| Var 6 | 0.878 | 1.698 | 0.913 | 0.181 | 0.896 | 1.732 | 0.931 | 0.184 |
| Var 7 | 0.926 | 1.026 | 0.041 | 0.484 | 0.917 | 1.016 | 0.041 | 0.479 |
| Var8 | 0.863 | 1.908 | 1.132 | 0.129 | 0.846 | 1.870 | 1.109 | 0.126 |
| Var 9 | 0.799 | 2.794 | 1.907 | 0.028 | 0.965 | 2.710 | 1.850 | 0.027 |
| Var 10 | 0.955 | 0.629 | -0.707 | 0.760 | 0.984 | 0.648 | -0.728 | 0.783 |
| Var 11 | 0.923 | 1.073 | 0.114 | 0.454 | 0.941 | 1.094 | 0.116 | 0.464 |
| Var 12 | 0.908 | 1.284 | 0.415 | 0.339 | 0.944 | 1.335 | 0.432 | 0.353 |
| Var 13 | 0.953 | 0.657 | -0.644 | 0.740 | 0.972 | 0.670 | -0.657 | 0.755 |
| Var 14 | 0.836 | 2.278 | 1.481 | 0.069 | 0.920 | 2.506 | 1.629 | 0.076 |
| Var 15 | 0.906 | 1.307 | 0.446 | 0.328 | 0.933 | 1.346 | 0.459 | 0.338 |
| Var 16 | 0.975 | 0.344 | -1.523 | 0.936 | 0.936 | 0.330 | -1.462 | 0.899 |
| Var 17 | 0.989 | 0.153 | -2.478 | 0.993 | 0.930 | 0.144 | -2.329 | 0.934 |
| Var18 | 0.919 | 1.129 | 0.198 | 0.422 | 0.970 | 1.192 | 0.209 | 0.445 |
| Var 19 | 0.871 | 1.804 | 1.026 | 0.152 | 0.962 | 1.993 | 1.134 | 0.168 |
| Var 20 | 0.965 | 0.485 | -1.069 | 0.858 | 0.936 | 0.470 | -1.037 | 0.832 |
| Var 21 | 0.746 | 3.535 | 2.436 | 0.007 | 0.836 | 3.959 | 2.728 | 0.008 |
| Var 22 | 0.997 | 0.040 | -3.817 | 1.000 | 0.947 | 0.038 | -3.626 | 0.950 |
| Var 23 | 0.834 | 2.307 | 1.507 | 0.066 | 0.854 | 2.362 | 1.543 | 0.068 |
| Var 24 | 0.901 | 1.376 | 0.535 | 0.296 | 0.922 | 1.408 | 0.547 | 0.303 |

Source: own calculations in Stata 12.

In order to reveal the link between variables which are not subordinated to the normal distribution law, we calculate the Spearman's correlation coefficient. The results of calculations for indicators are shown in Table 3.

**Table 3. Partial correlation coefficients between demand on the investment market and factors of its formation depending on the lags between indicators**

| Index | Capital investment | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Ukraine | | | | EU countries | | | |
| | lag 0 years | lag 1 year | lag 2 years | lag 3 years | lag 0 years | lag 1 year | lag 2 years | lag 3 years |
| var1 | 0.13 | 0.90 | 0.83 | 0.81 | 0.65 | 0.84 | 0.98 | 0.94 |
| Var 2 | 0.94 | 0.69 | 0.55 | 0.49 | 0.92 | 0.79 | 0.69 | 0.78 |
| Var 3 | -0.42 | -0.44 | -0.57 | -0.89 | -0.83 | -0.87 | -0.67 | -0.91 |
| Var 4 | 0.76 | 0.53 | 0.27 | 0.02 | 0.95 | 0.61 | 0.55 | 0.40 |
| Var 5 | 0.83 | 0.73 | 0.28 | 0.16 | 0.85 | 0.82 | 0.72 | 0.64 |
| Var 6 | 0.59 | – | – | – | 0.44 | 0.32 | 0.21 | 0.01 |
| Var 7 | 0.21 | -0.53 | -0.87 | -0.92 | -0.36 | -0.46 | -0.78 | -0.95 |
| Var8 | 0.48 | 0.38 | 0.40 | 0.62 | 0.33 | 0.26 | 0.01 | 0.32 |
| Var 9 | 0.32 | 0.19 | -0.23 | -0.15 | 0.37 | 0.25 | 0.21 | 0.01 |
| Var 10 | 0.17 | 0.29 | 0.44 | 0.53 | 0.25 | 0.66 | 0.79 | 0.98 |
| Var 11 | -0.32 | -0.02 | 0.28 | 0.60 | 0.01 | 0.46 | 0.79 | 0.85 |
| Var 12 | -0.28 | -0.63 | -0.78 | -0.94 | -0.37 | -0.46 | -0.79 | -0.95 |
| Var 13 | 0.55 | 0.29 | 0.17 | 0.19 | 0.21 | -0.01 | -0.37 | -0.15 |
| Var 14 | -0.67 | -0.60 | -0.47 | -0.49 | 0.37 | 0.55 | 0.86 | 0.90 |
| Var 15 | -0.20 | -0.64 | -0.90 | -0.95 | 0.55 | 0.32 | 0.30 | 0.11 |
| Var 16 | -0.18 | -0.46 | -0.64 | -0.82 | -0.37 | -0.55 | -0.70 | -0.68 |
| Var 17 | -0.55 | -0.53 | -0.74 | -0.89 | -0.66 | -0.75 | -0.87 | -0.93 |
| Var18 | 0.72 | 0.67 | 0.18 | 0.07 | 0.87 | 0.97 | 0.33 | 0.21 |
| Var 19 | -0.09 | 0.81 | 0.94 | 0.96 | 0.37 | 0.65 | 0.90 | 1.00 |
| Var 20 | 0.86 | 0.57 | – | – | 0.95 | 0.85 | 0.33 | 0.21 |
| Var 21 | 0.01 | 0.36 | 0.87 | 0.87 | 0.05 | 0.30 | 0.33 | 0.25 |
| Var 22 | -0.31 | -0.62 | -0.84 | – | -0.65 | -0.85 | -0.87 | -0.87 |
| Var 23 | -0.10 | -0.22 | -0.21 | -0.82 | -0.50 | -0.66 | -0.84 | -0.94 |
| Var 24 | -0.77 | -0.15 | – | – | -0.45 | -0.21 | 0.00 | – |

Source: own calculations in Stata 12.

Based on the analysis of the data from Table 3, it is necessary to point out that within 24 indicators of the impact on the demand level on the investment market, the following groups are defined: indicators, the time period which coincides with the time period of the capital investment, indicators, with lag of 1, 2 and 3 years. The calculations indicate the absence of the essential link between the analysed indicators for time lag 4 years and more. Therefore, we will represent the results of the study with time lag 0-3 years.

Taking into account the results of the third stage we will write the empiric regression equation of the capital investment dependence on the key factors of their formation on the investment market:

$$D(t)_{\text{UKR}} = d_0 \times u_1^{d_1}(t-l_1) \times u_2^{d_2}(t-l_2) \times u_3^{d_3}(t-l_3) \times u_4^{d_4}(t-l_4) \times u_5^{d_5}(t-l_5) \times u_7^{d_7}(t-l_7) \times u_{12}^{d_{12}}(t-l_{12}) \times u_{15}^{d_{15}}(t-l_{15}) \times u_{16}^{d_{16}}(t-l_{16}) \times u_{17}^{d_{17}}(t-l_{17}) \times u_{18}^{d_{18}}(t-l_{18})) \times u_{19}^{d_{19}}(t-l_{19})) \times u_{20}^{d_{20}}(t-l_{20})) \times u_{21}^{d_{21}}(t-l_{21})) \times u_{22}^{d_{22}}(t-l_{22})) \times u_{23}^{d_{23}}(t-l_{23})) \times u_{24}^{d_{24}}(t-l_{24})) \quad (2)$$

Since the multiplicative function is chosen to construct the models, the precondition to implement possibilities of the statistic analysis is to convert the equation to the linear form, i.e. its linearisation through taking the logarithm of the right and left parts, which in terms of the demand analysis is shown in the following way:

$$D(t)_{UKR} = \ln d_0 + d_1 \times \ln u_1(t-l_1) + d_2 \times \ln u_2(t-l_2) + d_3 \times \ln u_3(t-l_3) + d_4 \times \ln u_4(t-l_4) + d_5 \times \ln u_5(t-l_5) + d_7 \times \ln u_7(t-l_7) + d_{12} \times \ln u_{12}(t-l_{12}) + d_{15} \times \ln u_{15}(t-l_{15}) + d_{16} \times \ln u_{16}(t-l_{16}) + d_{17} \times \ln u_{17}(t-l_{17}) + d_{18} \times \ln u_{18}(t-l_{18}) + d_{19} \times \ln u_{19}(t-l_{19}) + d_{20} \times \ln u_{20}(t-l_{20}) + d_{21} \times \ln u_{21}(t-l_{21}) + d_{22} \times \ln u_{22}(t-l_{22}) + d_{23} \times \ln u_{23}(t-l_{23}) + d_{17} \times \ln u_{24}(t-l_{24}) \quad (3)$$

Transformation of the obtained data to the linearity on the investment market requires a transformation of the informational base (Table 3) to the form of Table 4.

In order to construct the econometric model, those drivers of the shadow economy are used for which the close correlation is observed during the three years of the study (0.7 and more). For example, since the EU countries do not have a strong link between the capital investment volume and the level of the deposit outflow, the number of the solvent banks, the level of import and export, the foregone earnings for export of goods and services, these indicators are not taken into account in the construction of the model.

**Table 4. Informational provision of the econometric model regarding the dependence of the demand level on the macroeconomic factors of the proper indicator formation on the investment market**

| Factor | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|
| Ln(d) | UKR | 12.15 | 12.47 | 12.59 | 12.50 | 12.30 | 12.52 | 12.79 | 12.93 |
| | EU | 19.28 | 19.60 | 19.72 | 19.63 | 19.43 | 19.65 | 19.93 | 20.06 |
| Ln($u_1$) | UKR | 2.45 | 2.52 | 2.10 | 1.97 | 2.75 | 3.23 | 2.85 | 2.77 |
| | EU | 2.82 | 2.89 | 2.47 | 2.34 | 3.12 | 3.60 | 3.23 | 3.14 |
| Ln($u_2$) | UKR | 2.31 | 2.22 | 2.56 | 2.65 | 2.60 | 2.57 | 2.21 | 2.35 |
| | EU | 4.17 | 3.47 | 1.95 | 2.08 | 2.08 | 2.20 | 2.20 | 2.20 |
| Ln($u_3$) | UKR | 4.99 | 4.91 | 4.91 | 3.33 | 3.33 | 1.61 | 1.61 | 1.61 |
| | EU | 12.12 | 12.04 | 12.04 | 10.47 | 10.47 | 8.74 | 8.74 | 8.74 |
| Ln($u_4$) | UKR | 10.88 | 11.03 | 11.16 | 11.27 | 11.30 | 11.50 | 11.65 | 11.87 |
| | EU | 18.01 | 18.16 | 18.30 | 18.40 | 18.43 | 18.64 | 18.79 | 19.01 |
| Ln($u_5$) | UKR | 1.32 | 1.95 | 1.74 | 1.45 | 1.01 | 0.89 | 0.94 | 1.01 |
| | EU | 1.65 | 2.05 | 1.86 | 1.63 | 1.16 | 1.10 | 1.13 | 1.22 |
| Ln($u_7$) | UKR | 4.70 | 4.69 | 4.71 | 4.67 | 4.46 | 4.50 | 4.67 | 4.78 |
| | EU | 4.72 | 4.70 | 4.72 | 4.68 | 4.47 | 4.51 | 4.68 | 4.79 |
| Ln($u_{10}$) | EU | 1.90 | 1.65 | 2.09 | 1.91 | 2.01 | 2.11 | 2.00 | 1.78 |
| Ln($u_{11}$) | EU | 12.45 | 12.40 | 12.35 | 12.27 | 12.32 | 12.96 | 13.25 | 12.41 |
| Ln($u_{12}$) | UKR | 10.85 | 11.13 | 11.14 | 11.06 | 10.89 | 10.55 | 10.50 | 10.68 |
| | EU | 17.98 | 18.27 | 18.27 | 18.19 | 18.03 | 17.68 | 17.64 | 17.81 |
| Ln($u_{14}$) | EU | 18.95 | 18.93 | 18.94 | 16.61 | 16.39 | 18.70 | 17.95 | 18.51 |
| Ln($u_{15}$) | UKR | 11.01 | 11.32 | 11.35 | 11.25 | 10.90 | 10.53 | 10.58 | 10.81 |
| Ln($u_{16}$) | UKR | 3.19 | 2.89 | 2.80 | 2.84 | -0.22 | 1.82 | 2.37 | 2.59 |

| Factor | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|
| $Ln(u_{17})$ | UKR | 4.05 | 4.02 | 4.04 | 4.01 | 4.00 | 3.96 | 3.96 | 3.96 |
| | EU | 3.89 | 3.86 | 3.89 | 3.86 | 3.84 | 3.81 | 3.80 | 3.80 |
| $Ln(u_{18})$ | UKR | 4.05 | 4.15 | 4.14 | 4.17 | 4.18 | 4.29 | 4.29 | 4.24 |
| | EU | 4.48 | 4.58 | 4.57 | 4.54 | 4.55 | 4.57 | 4.58 | 4.59 |
| $Ln(u_{19})$ | UKR | 4.69 | 4.65 | 4.60 | 4.61 | 4.83 | 4.96 | 4.72 | 4.73 |
| | EU | 4.56 | 4.52 | 4.47 | 4.48 | 4.69 | 4.83 | 4.59 | 4.60 |
| $Ln(u_{20})$ | UKR | 3.18 | 3.26 | 3.26 | 3.22 | 3.26 | 3.30 | 3.37 | 3.40 |
| | EU | 2.89 | 2.98 | 3.02 | 2.98 | 3.02 | 3.05 | 3.13 | 3.16 |
| $Ln(u_{21})$ | UKR | 5.20 | 5.17 | 5.17 | 5.17 | 5.19 | 5.09 | 4.76 | 4.53 |
| $Ln(u_{22})$ | UKR | 1.01 | 1.02 | 1.02 | 0.97 | 0.85 | 0.86 | 0.84 | 0.82 |
| | EU | 2.53 | 2.54 | 2.54 | 2.49 | 2.38 | 2.38 | 2.36 | 2.34 |
| $Ln(u_{23})$ | UKR | 7.21 | 6.89 | 7.23 | 6.49 | 6.36 | 6.36 | 6.66 | 7.09 |
| | EU | 12.04 | 11.72 | 12.05 | 11.32 | 11.19 | 11.19 | 11.49 | 11.92 |
| $Ln(u_{24})$ | UKR | 2.83 | 4.53 | 4.74 | 3.71 | -9.21 | 3.95 | 4.58 | 4.72 |

Source: own calculations in Stata 12.

The obtained results of the performed statistic analysis regarding the dependence of the capital investment level on the significant factors of the demand formation on the investment market are demonstrated in Table 5.

**Table 5. Results of the statistic analysis regarding the dependence of the capital investment level on the significant factors for the demand formation at the investment market**

| Factor | | Coefficient | Standard error | t-statistics | Down 95% | Upper 95% |
|---|---|---|---|---|---|---|
| Y-inter-section | Ukr | 0.12 | 0.04 | 1.915 | 0.42 | 0.42 |
| | EU | 0.21 | 0.03 | 2.011 | 0.67 | 0.37 |
| $u_1$ | Ukr | 0.36 | 0.09 | 0.875 | 0.36 | 0.36 |
| | EU | 0.42 | 0.04 | 0.831 | 0.42 | 0.42 |
| $u_2$ | Ukr | 0.44 | 0.07 | 2.419 | 0.44 | 0.44 |
| | EU | 0.38 | 0.06 | 2.540 | 0.38 | 0.38 |
| $u_3$ | Ukr | 0.13 | 0.11 | 0.086 | 0.13 | 0.13 |
| | EU | 0.11 | 0.09 | 0.099 | 0.11 | 0.11 |
| $u_4$ | Ukr | 0.39 | 0.08 | 1.173 | 0.39 | 0.39 |
| | EU | 0.18 | 0.02 | 1.232 | 0.18 | 0.18 |
| $u_5$ | Ukr | 0.41 | 0.10 | 1.587 | 0.41 | 0.41 |
| | EU | 0.24 | 0.07 | 1.666 | 0.24 | 0.24 |
| $u_7$ | Ukr | 0.46 | 0.04 | 4.234 | 0.46 | 0.46 |
| | EU | 0.54 | 0.05 | 3.175 | 0.54 | 0.54 |
| $u_{10}$ | EU | 0.38 | 0.06 | 1.702 | 0.38 | 0.38 |
| $u_{11}$ | EU | 0.25 | 0.12 | 1.516 | 0.25 | 0.25 |
| $u_{12}$ | Ukr | 0.41 | 0.09 | 1.621 | 0.41 | 0.41 |
| | EU | 0.17 | 0.04 | 0.197 | 0.17 | 0.17 |
| $u_{14}$ | EU | 0.34 | 0.03 | 11.327 | 0.34 | 0.34 |
| $u_{15}$ | Ukr | 0.39 | 0.10 | 1.212 | 0.39 | 0.39 |
| $u_{16}$ | Ukr | 0.19 | 0.11 | 0.178 | 0.19 | 0.19 |
| $u_{17}$ | Ukr | 0.49 | 0.01 | 13.020 | 0.49 | 0.49 |
| | EU | 0.52 | 0.04 | 4.489 | 0.52 | 0.52 |

| Factor | | Coefficient | Standard error | t-statistics | Down 95% | Upper 95% |
|---|---|---|---|---|---|---|
| $u_{18}$ | Ukr | 0.47 | 0.03 | 5.682 | 0.47 | 0.47 |
| | EU | 0.44 | 0.06 | 5.009 | 0.44 | 0.44 |
| $u_{19}$ | Ukr | 0.46 | 0.05 | 3.772 | 0.46 | 0.46 |
| | EU | 0.5 | 0.01 | 2.226 | 0.5 | 0.50 |
| $u_{20}$ | Ukr | 0.47 | 0.03 | 6.422 | 0.47 | 0.47 |
| | EU | 0.36 | 0.01 | 3.923 | 0.36 | 0.36 |
| $u_{21}$ | Ukr | 0.41 | 0.09 | 1.649 | 0.41 | 0.41 |
| $u_{22}$ | Ukr | 0.47 | 0.03 | 5.301 | 0.47 | 0.47 |
| | EU | 0.42 | 0.05 | 1.152 | 0.42 | 0.42 |
| $u_{23}$ | Ukr | 0.37 | 0.04 | 1.019 | 0.37 | 0.37 |
| | EU | 0.09 | 0.02 | 0.004 | 0.09 | 0.09 |
| $u_{24}$ | Ukr | 0.02 | 0.09 | 0.004 | 0.02 | 0.02 |

Source: own calculations in Stata 12.

Based on column 2 in Table 5, we receive a concrete form of the dependence of the capital investment level on the investment market through the following mathematical ratio:

$$D(t)_{UKR} = \mathrm{e}^{0,12} \times u_1^{0,36}(t-1) \times u_2^{0,44}(t) \times u_3^{0,13}(t-3) \times u_4^{0,39}(t) \times u_5^{0,41}(t) \times u_7^{0,46}(t-2) \times u_{12}^{0,41}(t-2) \times u_{15}^{0,39}(t-2) \times u_{16}^{0,19}(t-3) \times u_{17}^{0,49}(t-2) \times u_{18}^{0,47}(t) \times u_{19}^{0,46}(t-1) \times u_{20}^{0,47}(t) \times u_{21}^{0,41}(t-2) \times u_{22}^{0,47}(t-2) \times u_{23}^{0,37}(t-3) \times u_{24}^{0,02}(t) \quad (4)$$

$$D(t)_{EU} = \mathrm{e}^{0,21} \times u_1^{0,42}(t-1) \times u_2^{0,38}(t) \times u_3^{0,11}(t) \times u_4^{0,18}(t) \times u_5^{0,24}(t) \times u_7^{0,54}(t-2) \times u_{10}^{0,38}(t-2) \times u_{11}^{0,25}(t-2) \times u_{12}^{0,17}(t-2) \times u_{14}^{0,34}(t-2) \times u_{17}^{0,52}(t-1) \times u_{18}^{0,39}(t) \times u_{18}^{0,44}(t) \times u_{19}^{0,50}(t-2) \times u_{20}^{0,36}(t) \times u_{22}^{0,42}(t-1) \times u_{23}^{0,09}(t-2) \quad (5)$$

## CONCLUSIONS

In this study, the factorial indicators which have the highest, medium impact and those that practically do not affect the result indicator are identified. The results of the analysis carried out enable to define factors which do not influence the investment activity level in the EU countries and in Ukraine: the official level of unemployment, the official exchange rate of the national currency in relation to the Euro, the interest rate for deposits, the volume of public debt. At the same time, some drivers of the shadow economy, the impact of which differs depending on a country's economic development, are identified. Interest rate for credits, the level of the labour migration do not influence the capital investment volume in Ukraine, whereas for the EU countries the list of such factors is wider, they include the level of import and export, the level of the deposit outflow, the number of solvent banks, the foregone earnings for export of goods and services.

The defined factors of the shadow economy which influence the capital investment volume in the country can be the base for further scientific studies to find priority measures to increase a country's investment attractiveness. The results of the performed modelling can be tools to analyse the development of the native investment market by all entities. The state and economic entities, which may be either investors or consumers of the investment resources at once, have the ability operatively to make adjustments to their own strategy, oriented to increase the countries' economic growth and to satisfy

public needs in the case of the state regulation, and in the case of other participants from the investment market – to maximise the profit.

Despite the current limitation of the sample size through the analysis of only Ukraine as a country with an average level of development, which tries to be a member of the EU, that does not let to make general and fundamental conclusions, we prove that some drivers of the shadow economy influence the capital investment volumes of some countries in various ways. However, the reasons for these differences within this research are not analysed. Secondly, we do not consider the fact that for some factors an average correlation can be increasingly caused by the similarity of tendencies regarding the changes in these indicators, but not by the close relationship between them. Thirdly, the sample size is due to the limitation of data for some countries in the world that does not enable to take most factors into account.

The goal of further research may be to define the tightness and nature of the relationship between the analysed factors and to construct a model which considers the synergy effect from the complex influence of the analysed factors, provides the evaluation of the significance level regarding the shadow economy drivers together with other factors of the impact on the capital investment volume in a country.

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## Authors

The contribution share of authors is equal and amounted to 25% each of them.

**Yuriy Bilan**

Dr hab. (Rzeszow University of Technology, Poland), Professor (Rzeszow University of Technology, Poland). His research interests include economic development, investment, innovation activity, finance.
**Correspondence to:** Prof. Dr. Yuriy Bilan, Rzeszow University of Technology, Aleja Powstańców Warszawy 12, 35-959 Rzeszów, Poland, e-mail: y.bilan@prz.edu.pl
**ORCID** http://orcid.org/0000-0003-0268-009X

**Tatiana Vasylieva**

Doctor of Economics (Ukrainian Academy of Banking, Ukraine), Professor (Ukrainian Academy of Banking, Ukraine). Her research interests include banking, investment, risk management, innovation activity, social responsibility, education.
**Correspondence to:** Prof. Dr Tatiana Vasylieva, Oleg Balatskyi Academic and Research Institute of Finance, Economics and Management, Sumy State University, Rimsky-Korsakov st., 2, 40001, Sumy, Ukraine, e-mail: tavasilyeve@fem.sumdu.edu.ua
**ORCID** http://orcid.org/0000-0003-0635-7978

**Sergij Lyeonov**

Doctor of Economics (Ukrainian Academy of Banking, Ukraine), Professor (Ukrainian Academy of Banking, Ukraine). His research interests include banking, investment, risk management, innovation activity.
**Correspondence to:** Prof., Dr Sergij Lyeonov, Economic Cybernetics Department, Sumy State University, Rimsky-Korsakov st., 2, 40001, Sumy, Ukraine, e-mail: s.lieonov@uabs.sumdu.edu.ua
**ORCID** http://orcid.org/0000-0001-5639-3008

**Inna Tiutiunyk**

PhD in economics (Sumy State University, Ukraine). Her research interests include shadow economy, investment, finance, fiscal policy.
**Correspondence to:** PhD Inna Tiutiunyk, Finance and Entrepreneurship Department, Sumy State University, Rimsky-Korsakov st., 2, 40001, Sumy, Ukraine, e-mail: i.karpenko@finance.sumdu.edu.ua
**ORCID** http://orcid.org/0000-0001-5883-2940

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# The Attractiveness of Poland as a Medical Tourism Destination from the Perspective of German and British Consumers

**Diana Dryglas, Adrian Lubowiecki-Vikuk**

**ABSTRACT**

**Objective:** The aim of the article is an assessment of the attractiveness of Poland as a medical tourism destination (MTD).

**Research Design & Methods:** Survey data were collected from 282 German and British tourists, using a self-administered questionnaire. The Computer-Assisted Web Interviewing method was used to conduct the survey. Subsequently, the responses were analysed using advanced statistical tools (McNemar's exact test, Cochran's Q test snd Chi-square test).

**Findings:** The results indicated that tourists from Western Europe are currently more interested in using medical services in Central and Eastern Europe countries (CEEC) than in the past. Out of CEEC, Poland was the most frequently chosen MTD. Associations with Poland as a MTD were affected by such socio-demographic factors as age and nationality.

**Implications & Recommendations:** Identification of the growing importance of Poland as a MTD, as well as socio-demographic factors affecting the choice of Poland as a MTD have important implications for scholars, allowing them to understand how medical tourists evaluate the attractiveness of MTDs in Poland, and can be a useful tool for marketing planners, destination managers and marketers to create an effective marketing policy of MTDs in Poland.

**Contribution & Value Added:** The study fills an important gap regarding the lack of empirical content allowing for the exploration of the attractiveness of MTDs in Poland.

| | |
|---|---|
| **Article type:** | research article |
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## INTRODUCTION

Since the late 1990s – mainly because of mass media (television, the Internet, the press) and the tourism industry – medical tourism has gained momentum (Connell, 2016). This trend stems from 'changes in demographics, today's education, standard of living, social behaviour, and lifestyle' (Breitrück & Nunn, 2011, p. 57; Stankova, Tsvetkov, & Ivanova, 2019). Medical tourism should be perceived as a phenomenon in which patients travel outside their permanent place of residence to use health-related services, including tourism packages (Connell, 2013). It is a growing phenomenon spurred on by an increasingly empowered patient base searching for quality, affordability, availability, accessibility in healthcare, perceived quality, satisfaction, and trust in the staff and clinic, and attractiveness of a tourism destination (Choi, 2016; Connell, 2013), including access to treatments that are not legally allowed in the place of residence (Dryglas, 2018). The reasons why patients undertake medical trips also include a feeling of overall dissatisfaction with the national health system, or even the need to preserve confidentiality for some people seeking medical treatment (Cameron, Crooks, Chouinard, Snyder, Johnston, & Casey, 2014). As reported by Gupte and Panjamapirom (2014), the number of medical tourists increased from approximately 10.5 million in 2011 to 23.2 million in 2017, and generated global revenue of approximately USD 40-60 billion. For instance, in South Korea alone, medical tourism revenue in 2017 amounted to USD 15 billion and is predicted to reach USD 20 billion by 2022 (South Korea medical tourism market: Insights, opportunity, analysis, market shares and forecast 2017-2022, 2018). Nonetheless, according to Beladi, Chao, Ee and Hollas (2015), the output contribution of medical tourism is overestimated by an average of 26.8%.

In the field of science and social life, medical tourism is still not fully recognised or clearly defined (Connell, 2013). Various approaches are adopted in literature to explain this phenomenon, and thus the concept of medical tourism is still unstable. According to Connell, any medically-motivated cross-border mobility should be referred to as medical travel, 'but it should also be noted that 'medical tourism' will continue to be used for many components of that mobility' (Connell, 2013, p. 10).

Medical tourism is a complex process, resulting from the requirements of the modern market, particularly in terms of demand (Runnels & Carrera, 2012). The medical tourism market understood as 'the entirety of service-financial exchange relations between the provider (medical and tourism sector entity) and the beneficiary (medical tourist), occurring outside of the latter's place of permanent residence, who finances (or co-finances) the process of purchasing a package of services, which brings benefits to both sides' (Lubowiecki-Vikuk & Rab-Przybyłowicz, 2015, p. 87), is extensive and internally complex. This stems from a specific relation, namely an interdependent exchange taking place between providers and purchasers of both medical and tourism services, and paramedical and paratourism services (Heung, Kucukusta, & Song, 2010). This, in turn, necessitates interdisciplinary market research, including scientific studies, as a *status quo* from the medical and tourism point of view (Freyer & Kim, 2014). The medical tourism destination (MTD) applies to specific areas, i.e. countries, regions, cities and metropolitan areas (Ghanbari, Hajinejad, & Rahmani, 2014; Ormond & Kaspar, 2019), where the medical tourism product is offered, in other words prepared for sale as a package offer consisting of medical and tourism services, the basis for

which is set by the presence of clinics and private providers of medical services (Rab-Przybyłowicz, 2016). Nowadays, there are numerous countries which constitute MTDs, especially Asian countries (e.g. Singapore, India, Thailand, Malaysia, South Korea), the U.S., Mexico, countries of the Middle and South America (e.g. Crooks, Turner, Snyder, Johnston, & Kingsbury, 2011; Fetscherin & Stephano, 2016; Guiry & Vequist, 2015; Junio, Kim, & Lee, 2017; Mahendradhata, 2019). The remaining MTDs are still difficult to reach, especially the Balkan countries (Kiss, 2015) and Central and Eastern Europe countries (CEEC), where Poland is considered one of the MTD leaders in this part of Europe (Fetscherin & Stephano, 2016; Mainil, Eijgelaar, Klijs, Nawijn, & Peeters, 2017). Unlike in Asian countries and Western Europe, where the emphasis is put on prevention, mental and physical health, in CEEC the emphasis is primarily placed on physical health (Smith & Puczkó, 2014).

Extensive research into the phenomenon of MTDs conducted mainly in Asian MTDs and Western Europe (de la Hoz-Correa, Muñoz-Leiva, & Bakucz, 2018; Guiry & Veguist, 2015; Lu & Wu, 2018), strikingly reflects the fragmentary nature of scientific knowledge about this subject in CEEC. The above-mentioned studies focus on the analysis of risks, barriers and factors attracting foreign patients to a given destination (country, centre). Furthermore, Zarei and Maleki (2019) demonstrated that the perceived quality of medical services and patient satisfaction are the most important factors that attract medical tourists. What is also important are lower service costs and shorter wait time, which depend on the complexity and invasiveness of a given medical procedure (Connell, 2013). On the other hand, the authors state that the cooperation of entities offering medical services, the already mentioned quality of these services, insurance and legal provisions constitute the main barriers to the decision on having treatment abroad. A study by Sziva, Balázs, Michalkó, Kiss, Puczkó, Smith and Apró (2017) demonstrates that the potential of MTDs in CEEC has not been fully exploited. Therefore, the aim of the article is an empirical verification of the attractiveness of MTDs in Poland.

The contribution of this research is twofold. First, it provides an overview of MTD attractiveness in literature on medical tourism. Second, the empirical part of the study fills an important gap regarding the lack of empirical content allowing for the exploration of the attractiveness of MTDs in Poland. The study serves as a springboard for a discussion on the attractiveness of MTDs in Poland as perceived by foreign medical tourists. Hence, the study provides a thorough exploration of MTD attractiveness and its better understanding in CEEC through the analysis of Poland.

## LITERATURE REVIEW

Mayo and Jarvis (1981) define destination attractiveness as 'the relative importance of individual benefits and the perceived ability of the destination to deliver these individual benefits' (Mayo & Jarvis, 1981, p. 201). Only few attempts have been made to identify the attributes that medical tourists consider as important in evaluating the attractiveness of MTD and to investigate the contribution of MTD attributes to MTD attractiveness. A review of literature suggests that MTDs are multiattribute and thus the identification of the various categories of these attributes becomes important. According to Dryglas and Salamaga (2018), the existence of a MTD does not require natural resources but only particular political and legal regulations (e.g. provisions on abortion or transplantation), as well as medical infrastructure (a clinic or hospital). However, the perception of a MTD as a place with natural and cultural

attractions and a climate differing from those found at one's place of residence contributes to the formation of MTD attractiveness. The MTD attractiveness is primarily formed by medical treatments and services, destination attributes, and tourism-specific factors (Junio, Kim, & Lee, 2017). The research conducted by Lu and Wu (2015) clearly shows that medical tourists felt that higher service quality led to better corporate image of medical institutions, which was reflected in positive influences on the perceived value of MTD. With reference to the destination components of UNWTO (2007), Pollard (2012) distinguished seven criterions of MTD attractiveness: destination image ('place myths'), risk and reward (outcome, guarantee, track record, safety), geographical proximity (travel convenience – access and barriers, travel time), infrastructure (support services, internal travel, accommodation), cultural proximity (language, food, customs and practices, religion), destination environment (climate, facilities, tourism attractions), and price (cost of stay, insurance, cost of treatment, cost of travel). What constitutes the MTD attractiveness is, among other things: favorable climate, beautiful and often pristine natural environment, convenient location in Europe and competitive and sometimes relatively low prices for international medical tourists (Kiss, 2015; Smith & Puczkó, 2014). This part of Europe is not only touristically attractive, but also innovative as for the access to technological medical specialisations (Wisla & Sierotowicz, 2016). Yet, the number of tourist agencies specialising in medical tourism is growing in CEEC (Dryglas, 2018; Smith, Puczkó, Michalkó, Kiss, & Sziva, 2016). It is crucial since according to Hemdi, Hassan, Aminuddin and Adanan (2016) as well as Idrus, Musa, Naziman, Aznan, Othman and Pauzi (2012) MTD attractiveness will positively and significantly influence a future choice of a MTD. This study extends prior studies through categorising the attributes of MTD attractiveness into medical and tourism characteristics (Table 1). Based on the literature of the subject, medical and tourism attributes that constitute MTD attractiveness can be divided into: (1) economic factors (lower costs of treatment abroad, the economic development of enterprises, country/region development), (2) cultural and social factors (the need to preserve confidentiality for some people seeking medical treatment), (3) organisational-legal factors (avoiding queues, access to medical procedures that are illegal in the patient's country of origin, effective marketing representatives of medical facilities, the ability to refund part of the cost of treatment), (4) technological factors (a high standard of medical care using state-of-the-art equipment), (5) spatial factors (travel distance), (6) natural factors (e.g. favourable climate) (Chew & Koeshendro, 2015; Connell, 2013; Fetscherin & Stephano, 2016; Ganguli & Ebrahim, 2017; Lubowiecki-Vikuk, 2018; Lubowiecki-Vikuk & Gnusowski, 2016; Lunt, Smith, Mannion, Green, Exworthy, Hanefeld, & *et al.,* 2014).

However, negative characteristics may significantly limit the possibilities of MTD image development in a given CEEC. This is particularly visible in MTDs of CEEC which, on the one hand, have the potential of being perceived as attractive but, on the other, are not well known among potential medical tourists who base their associations on unfavorable stereotypes rather than on facts. Stereotypes are very common in the medical tourism market. In the context of CEEC, potential medical tourists are aware that such countries exist but they know little of the medical tourism product offered there. Thus, the problem of the country image can be a barrier to the development of MTD despite its attractiveness. An example of such a destructive influence of image on MTD development is the position of CEEC in the international market of medical tourism. Developing countries constitute a good example here because they are perceived as countries with low-quality services and skills of doctors, which in turn leads

to scepticism among patients (Borek, 2013). Therefore, Crooks *et al.* (2011) are right when they claim that such countries need to portray safe and advanced treatment facilities in order to dispel the potential patients' suspicions that their medical care is of lower quality. Macedonia sets a good example of a country which is planning to offer subsidies and tax breaks to foreign hospitals setting up facilities for treating private and foreign patients in a bid to improve its image as an MTD (Smith *et al.*, 2016). However, the medical tourism market in CEEC is growing at the rate of approximately 12-15% per year. The value of the international patient market in CEEC is estimated at more than USD 100 million, representing the average rate of about 26,500 hospital patients a year, 6-8,000 of whom are treated in Poland. While the concept of choosing an MTD in Western Europe and Asian countries (e.g. de la Hoz-Correa *et al.*, 2018) has been extensively examined in the medical tourism literature, there have been no studies that would attempt to assess CEEC, including the attractiveness of Poland's MTDs.

**Table 1. Medical and tourist attributes of MTD attractiveness**

| | Attributes | Authors |
|---|---|---|
| **Medical** | Spatial factors: innovative medical infrastructure, development of commercial medical facilities. | Dryglas & Salamaga (2018); Ormond, Wong, & Chan (2014); Wisla & Sierotowicz (2016). |
| | Cultural and social factors: language, number of physicians, nurses and dentists and their medical competences, availability of high-quality medical professionals and accredited clinics or hospitals. | Koggalage, Gunawardena, & de Silva (2017); Lubowiecki-Vikuk & Gnusowski (2016); Lubowiecki-Vikuk & Kurkowiak (2017); Mahendradhata (2019); Zhang, Seo, & Lee (2013). |
| | Technological factors: quality or faster access to treatments and new therapies. | Connell (2013); Fetscherin & Stephano (2016); Hopkins, Labonte, Runnels, & Packer (2010); Junio, Kim, & Lee (2017); Lunt *et al.* (2014); Tham (2018); Wang (2012). |
| | Organisational-legal factors: liberalisation in health care systems, a combination of industry-specific management strategies which facilitate effective public-private partnerships, reinvent healthcare legislation and encourage investment in medical tourism infrastructure, informal economies and social care networks. | Dryglas & Salamaga (2018); Ebrahim & Ganguli (2017); Johnston, Crooks, Snyder, & Kingsbury (2010); Ormond & Sulianti (2017); Ried & Marschall (2016); Zhang, Seo, & Lee (2013). |
| | Economic factors: cost. | Connell (2013); Fetscherin & Stephano (2016); Lubowiecki-Vikuk (2018); Lubowiecki-Vikuk & Kurkowiak (2017); Lunt *et al.* (2014); Pollard (2012); Smith, Mannion, Green, Exworthy, Hanefeld & *et al.* (2014); Zhang *et al.* (2013). |
| **Tourist** | Natural factors: climate, natural resources. | Dryglas (2018); Dryglas & Salamaga (2017, 2018) |
| | Organisational-legal factors: access to broker of medical tourism and tourist agencies specialising in medical tourism. | Casey, Crooks, Snyder, & Turner (2013); Dryglas (2018); Heung, Kucukusta, & Song (2010); Smith *et al.* (2016); Tham (2018). |
| | Spatial factors: tourist attractions. | Connell (2013); Fetscherin & Stephano (2016); Kiss (2015); Lubowiecki-Vikuk & Kurkowiak (2017); Pollard (2012); Rab-Przybyłowicz (2016); Smith & Puczkó (2014). |

Source: own study.

Consequently, this gap in the literature led to the following hypothesis:

**H1:** The number of Britons and Germans interested in medical services provided outside their countries who would like to use medical services in CEEC is greater than the number of people who have already used such services in CEEC.

The data for 2009 indicate that foreign patients spent approx. USD 200 million on medical tourism services in Poland. Two years later, there was an increase by almost 20% (OECD, 2014). As reported by Rab-Przybyłowicz (2016), in 2015 most of the tourism-related spending in Poland was generated by foreign tourists who visited the country for health/medical reasons. An average tourist spent around USD 490 per day/per person compared to USD 742 per day/per person spent by a medical tourist. Unfortunately, the size of the Polish medical tourism market has not been estimated yet due to the lack of fully reliable scientific research. The statistical data available are most often constructed rather intuitively, based on individual regional data, drawing on the analyses of the global medical tourism industry (Connell, 2016). The medical tourism in Poland is related in particular to private providers of medical services. For this reason, the overall assessment of the healthcare system quality published periodically by the WHO and the OECD which regards the dominant public sector in Poland may not reflect a better quality and standards of healthcare provided by private health centres used by foreign patients (Borek, 2013, p. 342). It should also be taken into account that the rankings of the quality and accessibility of healthcare which are widely available to foreign patients are unfavourable for Poland. Apart from that, no systematic analysis of the data concerning the quality, efficiency and availability of medical care provided by private centres has been conducted yet. In the years 2011-14, the medical tourism market in Poland was dominated by Polish citizens, and every third and every fifth medical tourist came from the UK and Germany, respectively (Lubowiecki-Vikuk & Rab-Przybyłowicz, 2015). For medical purposes, Poland was also visited by citizens of Ireland, the USA, the Netherlands, Norway, Denmark and Sweden. Apart from the EU citizens, there appeared a segment of tourists from the Commonwealth of Independent States and the Persian Gulf. Over 40,500 foreign patients (mainly males) used the services of pharmacies in southern Poland in the year 2014. They came from the UK, Germany, Russia, the Czech Republic and, less frequently, from Asian countries (Lubowiecki-Vikuk & Mucha, 2015). In Poland medical tourism is treated as an export product (Euromonitor International, 2014; OECD, 2014). Thus, medical tourism was one of the priority industries promoted by the Ministry of Economy in the years 2012-2015, and in the years 2017-2019 with a 2022 perspective it is going to be promoted by the Polish Tourist Organisation (PTO). Creating the image of Poland as an MTD has mainly been based on the participation of medical and paramedical entities, including tourism ones, in foreign trade missions and medical tourism fairs.

PTO (2016) in a broad aspect, i.e. pro-health services, promotes inter alia medical tourism in foreign markets, constituting one of those entities which contribute to creating an image of Poland as an MTD. These actions are aimed at Russian, Ukrainian, Norwegian, American and Arabic markets, which is a result of EU subsidies. According to the PTO (2015) reports, foreign tourists expressed satisfaction with their stay in Poland. This is connected with their activities conducive to high satisfaction, among which treatments 'for health & beauty' are of particular importance. Foreign tourists perceive Poland as: touristically attractive; offering the possibility of spending free time in line with one's

preferences; a place which is worth further exploring, and a country which does not pose a threat to tourists. Furthermore, the country is primarily associated with cities (city break), visiting monuments, museums, forests and national parks and UNESCO sites. Yet, it is pointed out that Poland still does not have a distinctive, coherent and attractive MTD image abroad (Kiryluk & Glińska, 2015).

While there have been studies that attempted to identify the scale of the development of MTDs in CEEC (Fetscherin & Stephano, 2016), there have been no studies that would assess which of the MTDs in CEEC is most popular among medical tourists.

This study was an attempt to bridge this gap and therefore it puts forward another hypothesis:

**H2:** Poland is the country most frequently chosen by Britons and Germans who have already used or would like to use medical services in the CEEC region.

According to Buhalis (2000), each type of destination can only match certain types of demand. For that reason MTDs do not endeavor to cater for the entire market, seeing the futility of such efforts. Thus, MTD attractiveness necessitates looking at the attributes of its constitution through the prism of individual market segments. In this context, some authors indicate that demographic factors like age, gender, or nationality affect the perception of the tourism destination (e.g. Rittichainuwat, Qu, & Brown, 2001). This leads to selecting segments which attributes of MTD attractiveness will be targeted at and developing a suitable marketing strategy for each of them (Dryglas & Salamaga, 2018). In the present study, the focus is placed especially on gender, age and nationality segmentation analysis regarded as segmentation based on socio-demographic variables. As the market of recipients of medical services offered by Poland is not a unified whole, it is crucial that local governments and MTD managers distinguish its segments based on socio-demographic factors and target particular attributes which constitute the attractiveness of Poland's MTD at a specific type of consumers in order to make MTDs in Poland more competitive on the European medical market.

Hence the attempt to demonstrate relations between particular attributes of the attractiveness of Poland's MTD market and socio-demographic factors.

Therefore, the additional research hypothesis is as follows:

**H3:** Respondents' opinions about Poland as a MTD are influenced by socio-demographic factors.

## MATERIAL AND METHODS

The research material for the study was obtained through surveys carried out among Britons and Germans who constitute a large segment of medical tourists in Poland. They were considered the best research samples for studying Poland's identity as an MTD because studies by Lunt *et al.* (2014) and Hanefeld, Smith and Noree (2016) demonstrate that Poland is the leading MTD among CEECs in the case of Britons, and Schmerler (2018) reports that the same is true in the case of Germans, which stems from cross-border collaboration between providers and insurers (Ried & Marschall, 2016). On the basis of information from Medical Tourism Association (MTA, 2015) and the *International Medical Travel Journal* on accredited and certified medical tourism entities those operating in Germany and Great

Britain were selected. They were subsequently sent the Internet address of the questionnaire. An invitation to participate in the study was also made available on specially dedicated online forums and social networking sites, since as proved by Abubakar and Ilkan (2016) – virtual community membership has a strong influence on a medical tourist's behaviours and the way information is transmitted. In this way, the questionnaire was targeted at a clearly defined group of people, i.e. those who were interested in medical services provided outside their country or had already used such services and at the same time visited selected websites related to medical tourism in CEEC.

A total of 300 responses in German and English were received. Out of these, 18 questionnaires were excluded from the analysis due to incomplete information they contained. The final sample constituted ($n$ = 282) valid and usable responses. In accordance with Westland's (2010) statistical algorithm for computing the absolute minimum sample size, the lower bound on sample size was established at 228 respondents. Therefore, our sample of 282 fulfills the recommended minimum sample size for sampling adequacy. For a sample size of 282 and a confidence interval of 95%, the resulting sample error is 5.8%. The characteristics of the target group were determined in advance. Both Britons and Germans completed the same number of surveys ($n$ = 141), with an equal number of female and male respondents (71 vs. 70).

The study was conducted from 1 to 30 September, 2015, just after the end of the tourist season. The pilot version of the questionnaire was administered to 20 tourists to ensure that the questions were comprehensible. Their feedback and suggestions were incorporated into the final instrument.

The survey questionnaire, modified after the pilot study ($n$ = 20) and based on literature review consisted of 3 questions. The first question ($Q_1$) was: *Would you like to use medical services in CEEC?* (Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Moldova, Montenegro, Poland, Romania, Serbia, Slovakia, Slovenia and Ukraine – binary variable with values 1 – Yes and 0 – No). The second question ($Q_2$) was: *Have you used medical services in CEEC?* (binary variable with values 1 or 0, measured among respondents who chose at least one country in $Q_1$ or $Q_2$, the variable takes the value of 1 if a given country was indicated by the respondent and 0 otherwise). The third question ($Q_3$) was: *What attributes do you associate Poland with*? (i.e. non-medical attributes: tourism and leisure activities, big cities, historical monuments, art and culture, nature/scenery, Polish food, great shopping, friendly people, famous Poles, family/friends, developing country; medical attributes: medical services). Furthermore, with multiple-response categorical variables, each attribute was a binary response with value 1 (the attribute was indicated) or 0 (the attribute was not indicated).

In the first question, the respondents could choose a maximum of 3 CEEC. In the second question, apart from indicating 3 CEEC, the respondents could choose an answer stating that they had not had any experience with medical tourism. We also collected data on the gender, age and nationality of the respondents.

The Computer-Assisted Web Interviewing (CAWI) method was used to conduct the survey. The method was based on the technique of computer-assisted data collection. The advantage of this method is that it minimises errors by automatically saving the database and its low cost. When choosing the CAWI method, the authors largely sought to keep private space of the researched community due to the fact that medical tourists

are a research group fairly hard to reach, given the characteristics of a postmodern society, where the Internet plays an important role in everyday life, becoming a tool for interdisciplinary research (Zając & Batorski, 2009). The participation in this kind of study is associated with comfortable conditions, for instance the respondents can choose convenient time for filling the questionnaire. However, as indicated by Connell (2016), websites are frequently the first contact point with potential international service providers and the Internet plays a critical role on the medical tourism market.

In order to compare the probability of success of two paired variables, McNemar's exact test was used (Westfall, Troendle, & Pennello, 2010). In order to compare the probability of success of more than two paired variables, Cochran's Q test (Cochran, 1950) was used. In order to test the independence of categorical variables, Chi-square test (Satorra & Bentler, 1994) was used. In order to test the independence of single-response categorical variable and multiple-response categorical variable, a test based on adjusted Chi-square statistic (Bilder & Loughin, 2004) as well as the Rao-Scott second-order adjustment to Chi-square statistic and its sampling distribution were used. In order to adjust the *p*-value, the Benjamini-Hochberg method (Benjamini & Hochberg, 1995) was applied in multiple pairwise comparisons with the use of McNemar's exact test. Simultaneously testing the set of variables regarding the independence of variables, the Bonferroni (1936) correction was used to correct *p*-value. The significance level was assumed to be 0.05 for all statistical tests.

## RESULTS

In order to demonstrate that the number of people who would like to use medical services in CEEC is greater than the number of people who have already used such services in CEEC (H1), McNemar's exact test was used. Based on the test performed (T = 116, *p*-value < 0.001), it may be concluded that the distribution of results ($Q_1$ – Yes: 93.6%; $Q_2$ – Yes: 53.7%) points to a greater proportion of respondents wanting to use medical services in CEEC than the proportion of respondents who have already used such services in these countries, provided that the significance level is 0.05. With regard to Table 2, the chi-square test of independence (T = 7.6831, df = 1, *p*-value < 0.01) indicated that there is a correlation between answers to question 1 and 2 at the significance level of 0.05. Therefore, hypothesis H1 may be fully confirmed.

**Table 2. Contingency table $Q_1$ *vs.* $Q_2$**

| Contingency | | $Q_1$ | |
|---|---|---|---|
| | | Yes | No |
| $Q_2$ | Yes | 147 | 116 |
| | No | 4 | 14 |

Source: own study.

In order to verify hypotheses H2 and H3, Cochran's Q test and multiple pairwise comparisons with the use of McNemar's exact test and the Benjamini-Hochberg method were used. As for H2, the results of the first test (T = 1442.682, df = 18, *p*-value < 0.001) indicated that there exists at least one pair of countries for which probability of success differs, at

the significance level of 0.05. In order to determine which of the pairs differ, multiple pairwise comparisons (171) between countries s and t, where s ≠ t and s, t = 1,...,19 were conducted using McNemar's exact test as well as the Benjamini-Hochberg method as adjustment methods for *p*-value. In 108 cases out of 171, the null hypothesis was rejected at the significance level of 0.05. This means that there are 108 pairs of countries for which probability of success differs. In particular, Poland compared to every other country, belongs to this group with the smallest *adjusted p-values. Table 3 presents the first 20 pairs out of 108* in *ascending order by adjusted p-value.* Thus, it may be concluded that the percentage of answers pertaining to the country most frequently chosen by tourists who have already used or would like to use medical services in CEEC is the highest for Poland (83.5%), and the results of the statistical tests performed indicate that it is also significantly different from the other values, which confirms H2.

**Table 3. The first 20 pairs of countries with different probability of success**

| Comparison | *p*.adjust |
|---|---|
| Bosnia and Herzegovina – Poland | 2.03E-64 |
| Poland – Ukraine | 4.06E-64 |
| Macedonia – Poland | 9.52E-64 |
| Belarus – Poland | 5.64E-63 |
| Albania – Poland | 4.75E-60 |
| Latvia – Poland | 1.54E-59 |
| Moldova – Poland | 8.40E-59 |
| Montenegro – Poland | 8.40E-59 |
| Poland – Serbia | 1.46E-58 |
| Lithuania – Poland | 1.00E-57 |
| Croatia – Poland | 1.73E-43 |
| Estonia – Poland | 3.88E-43 |
| Poland – Slovenia | 2.88E-42 |
| Bulgaria – Poland | 4.23E-41 |
| Poland – the Czech Republic | 3.28E-37 |
| Poland – Romania | 2.71E-35 |
| Poland – Slovakia | 7.23E-35 |
| Hungary – Poland | 5.49E-34 |
| Macedonia – the Czech Republic | 2.44E-19 |
| Macedonia – Slovakia | 2.64E-19 |

Source: own study.

In order to verify H3, a test for independence between single-response categorical variable X and multiple-response categorical variable Y was used based on the Rao-Scott second-order adjustment to the Pearson statistic and its sampling distribution.

Based on the results of the statistical test performed (T.adj = 9.25, df.adj = 9.67, *p*.adj = 0.4775; T.adj = 80.62, df.adj = 34.67, *p*.adj < 0.0001; T.adj = 122.6, df.adj = 10.64, *p*.adj < 0.0001), it may be concluded that since *p*-value > 0.05, respectively: gender does not influence the choice of attributes and age and nationality influence the choice of attributes. In order to simultaneously test a set of variables included in H3 the Bonferroni correction was applied. The following *p*-values were obtained: 1.0000, 0.0000, 0.0000. Therefore, respondents' opinions do not depend on gender, but depend on age and nationality. Thus,

it may be concluded that in light of the values presented in Table 4 and the results of the statistical test performed, hypothesis H3 may be partially confirmed.

## CONCLUSIONS AND DISCUSSION

The results of the present empirical study indicate that tourists from Western Europe are currently more interested in using medical services in Poland than in the past. This is due to the involvement of respective governments in the development of medical tourism of the countries concerned (Ganguli & Ebrahim, 2017). Recently, medical tourism has become a part of the policy of governments in CEEC, among them Montenegro and Poland. Its objective is not only an effective intervention in the national healthcare system or an increase in exports of medical services, but also an improvement of a poor image of MTD (Ormond, 2011). Good practices of governments include the support and creation of MTD image (Jónás-Berki, Csapó, Pálfi, & Aubert, 2015). They are primarily based on: incentives, government promotion and policy investments (Kowalska-Bobko, Mokrzycka, Sagan, Włodarczyk, & Zabdyr-Jamróz, 2016). Additionally, they encourage cooperation and partnerships between the public and private medical and tourism sectors (Iordache, Ciochină, & Popa, 2013).

Out of CEEC, Poland was the most frequently chosen MTD because in Poland costs of healthcare services are often lower than in the countries of Western Europe, and the standard of these services is considered to be high (Euromonitor International, 2014). What is also worth emphasising is the fact that associations with a given destination are affected by such socio-demographic factors as age and nationality but not gender, which may stem from the fact that awareness and national identity play a greater role when choosing attributes defining an MTD. So, the concept of building MTD attractiveness is the result of not only specific features of an MTD, which determine its market success, but also, to a large extent, of how the medical tourists perceive a given MTD.

The added value of the present work, which contributes to the development of marketing in MTDs, encompasses the cognitive (empirical) and applied dimensions. As regards the empirical part, identification of the growing importance of Poland as a MTD, as well as the socio-demographic factors affecting the choice of a given MTD can be a useful tool for marketing planners, destination managers and marketers to create an effective marketing policy of MTDs. This approach implies collaborative, cooperative and multilevel way of MTD management. In other words, the managers of the supply-side entities providing medical tourism services and destination management organisations should be an active nexus between different actors involved in enterprise and destination management, planning and policy making. Consequently, what is necessary to create the attractiveness of MTDs in Poland is cooperation at the national level, regional level (between individual regions) and local level (between local authorities and medical and tourist enterprises as well as collaboration of medical and tourism companies).

Due to time and financial limitations of the project, the empirical research was conducted only in reference to selected medical tourists. The obstacles mentioned do not diminish the cognitive value of the research. They constitute a starting point for further research studies, which should be aiming especially at a deeper exploration of MTD attractiveness in Poland. This study was limited by the methodology applied as outlined below.

**Table 4. Value distribution by gender, age, and nationality**

| Category | | Tourism and leisure activities | | Big cities | | Historical monuments, art and culture | | Nature / scenery | | Polish food | | Great shopping | | Friendly people | | Famous Poles | | Family / friends | | Developing country | | Medical services | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| Gender | male | 116 | 23 | 85 | 54 | 119 | 20 | 121 | 18 | 95 | 44 | 122 | 17 | 105 | 34 | 91 | 48 | 127 | 12 | 126 | 13 | 78 | 61 |
| | female | 119 | 23 | 89 | 53 | 112 | 30 | 119 | 23 | 102 | 40 | 119 | 23 | 98 | 44 | 99 | 43 | 133 | 9 | 136 | 6 | 72 | 70 |
| Age | 18–29 | 42 | 7 | 21 | 28 | 42 | 7 | 44 | 5 | 37 | 12 | 37 | 12 | 39 | 10 | 33 | 16 | 39 | 10 | 44 | 5 | 34 | 15 |
| | 30–39 | 42 | 15 | 40 | 17 | 46 | 11 | 49 | 8 | 36 | 21 | 48 | 9 | 40 | 17 | 37 | 20 | 56 | 1 | 55 | 2 | 34 | 23 |
| | 40–49 | 49 | 16 | 42 | 23 | 52 | 13 | 51 | 14 | 44 | 21 | 56 | 9 | 51 | 14 | 53 | 12 | 63 | 2 | 61 | 4 | 33 | 32 |
| | 50–59 | 58 | 3 | 38 | 23 | 49 | 12 | 53 | 8 | 48 | 13 | 53 | 8 | 33 | 28 | 40 | 21 | 60 | 1 | 56 | 5 | 29 | 32 |
| | ≥60 | 44 | 5 | 33 | 16 | 42 | 7 | 43 | 6 | 32 | 17 | 47 | 2 | 40 | 9 | 27 | 22 | 42 | 7 | 46 | 3 | 20 | 29 |
| Nationality | German | 128 | 12 | 70 | 70 | 133 | 7 | 121 | 19 | 95 | 45 | 126 | 14 | 121 | 19 | 77 | 63 | 122 | 18 | 129 | 11 | 71 | 69 |
| | British | 107 | 34 | 104 | 37 | 98 | 43 | 119 | 22 | 102 | 39 | 115 | 26 | 82 | 59 | 113 | 28 | 138 | 3 | 133 | 8 | 79 | 62 |

Notes: 0 – attribute was not chosen, 1 – attribute waschosen
Source: own study.

The CAWI method has some disadvantages. A lot of people still do not have Internet access, although various studies suggest that electronic word-of-mouth is now the most common source of information to medical travellers.

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## Authors

Contribution share of authors is equal and amounted to 50% each of them: D. Dryglas – contributed to the discussion, and performed the statistical analyses; A. Lubowiecki-Vikuk – conceived the study, designed the study, collected data and drafted the manuscript.

**Diana Dryglas**

Associate Professor at the Department of General Geology and Geotourism of the AGH University of Science and Technology. Her research interests include management of a tourism product and tourism destination, and health tourism, especially therapeutic (healing) tourism.

**Correspondence to:** Dr hab. Diana Dryglas, AGH University of Science and Technology, Department of General Geology and Geotourism, Al. Mickiewicza, 30, 30-059 Krakow, Poland, e-mail: ddryglas@agh.edu.pl

**ORCID** http://orcid.org/0000-0001-6136-1369

**Adrian Lubowiecki-Vikuk**

Assistant Professor at the Department of Consumer Behaviour Research of the Warsaw School of Economics. His research interests include consumer behaviour in the area of sport, tourism and medicine.

**Correspondence to:** Dr Adrian Lubowiecki-Vikuk, Warsaw School of Economics, Institute of Management, Department of Consumer Behaviour Research, Al. Niepodległości, 162, 02-554 Warsaw, Poland, e-mail: adrian.lubowiecki-vikuk@sgh.waw.pl

**ORCID** http://orcid.org/0000-0001-9672-9514

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# New Imperative of Corporate Value Creation in Face of the Challenges of Sustainable Development

**Andrzej Jaki, Barbara Siuta-Tokarska**

**ABSTRACT**

**Objective:** The aim of the article is to present and exemplify the mechanisms of changes in defining and influencing the new imperative of corporate value creation. It is implied by the impact of the sustainable development concept.

**Research Design & Methods:** The research focused on the concept of corporate value creation in the context of the challenges connected to sustainable development. In the article, both inductive and deductive ways of reasoning were adopted, which makes it possible to combine the results of the detailed research.

**Findings:** The publication indicates the emerging need for a change in the manner of perceiving and thinking about values – 'from grasping value for today – towards the value of the future.' This is related to the need to formulate the new imperative of corporate value creation.

**Implications & Recommendations:** The reasonable profit concept can also be the basis for the formulation of the postulate of 'reasonable speed of corporate value creation.' Therefore, there is a need to redefine the existing imperative of corporate value creation and implement a new imperative based on the idea of the responsibility for the existence and long-term development of the enterprise.

**Contribution & Value Added:** The result is the disclosure of the emergence of a hybrid concept of sustainable value-based management. The added value of this article is the proposal to create a new imperative of corporate value creation based on the foundation of the restitution of the idea of responsibility.

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|---|---|
| **Article type:** | conceptual article |
| **Keywords:** | theory of development; sustainable development; corporate value creation; value-based management; sustainable value-based management |
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## INTRODUCTION

In the source approach, sustainable development is understood as a process of transformations that is supposed to ensure that the needs of the present generation are met without compromising the developmental opportunities of future generations (by means of integrated activities with regard to the natural, social, and economic environments). The implementation of global-scale activities has its sources in the local space; these activities are manifested in practice in the effects of the functioning of business entities of different sizes (including very large, large, and small enterprises) in the context of natural, social, and economic capital, among others.

The activity of enterprises translates directly into the natural environmental, social, and economic systems in which they accomplish their goal. Therefore, sustainable development on the level of an enterprise means the broadly understood ecologisation of the operational processes with a simultaneous attempt to fulfill the expectations of possibly all stakeholders (including the financial expectations of the owners, the needs for the safety and stabilisation of the employees, and others). In the macro-economic dimension, it refers threefold (economically, socially, and ecologically) to the sustainable socio-economic development that is the foundation for the strand of economics called New Pragmatism (Kolodko, 2017).

Striving for the sustainable development of an enterprise has significantly influenced the conditionings that accompany the realisation of the basic financial goal, which is market value maximisation. The conclusions coming from both the implementation and use of the value-based management concept as well as the experiences of the latest global economic crisis related to the mentioned concept showed the need to expose the shared value creation as the fundamental goal of an enterprise on the one hand and the postulate for the evolution of the value-based management concept towards the new hybrid concept of sustainable value-based management on the other.

The aim of the article is to present and exemplify the mechanisms of changes in defining and influencing the imperative of corporate value creation implied by the impact of the sustainable development concept and a relative need for the coincidental treatment of the environmental, social, and economic conditionings of the management process.

The research problem posed by the authors of this publication does not solely concern the question of the observed effects of changes in the contemporary economy; i.e., the lack of sustainability between the three economic pillars (natural, social, and economic capital) is also connected with the search for their sources. The authors are of the opinion that the reason for this situation is the misunderstanding and lack of the actual implementation of some 'values' that may be regarded as superior in the socio-economic life of a person living at the turn of the 21st century. This lack of value implementation is manifested in the bitter taste of the so-called liquid modernity described by Bauman (2000) in the context of social philosophy. In this field, a type of research gap appears that has been identified as the previous lack of correlation between the concept of sustainable development and the concept of creating organisational values in the aspect of a new way of understanding the imperative of creating values.

The authors claim that the tendency to multiply the value of invested capital and the need for development should be sustainable and long-lasting, and it should be character-

ised by the responsibility for the existence and future prosperity of the organisation. Moreover, the publication indicates the emerging need for a change in the manner of perceiving and thinking about values (environmental, social, and economic ones): 'from grasping value for today – towards the value of the future'.

The article is structured as follows. First, we present our research questions and methods, followed by a literature review and theory development. This chapter is divided into five sections. The first two sections present the concept of sustainable development and its connection with the category of value. The next two show the essence of the imperative of corporate value creation and the concept of value-based management; the need for changes in this concept are also indicated here. Finally, the last section presents the new concept of sustainable value-based management, followed by our conclusions.

## MATERIAL AND METHODS

Presenting and exemplifying the mechanisms of changes in defining and influencing the imperative of corporate value creation (including striving to link the concept of value-based management with the concept of sustainable development) required the formulation of research questions that would specify the aim of the article. The research questions presented below were posed in connection with the above-mentioned obstacles and problems. To answer them, some theoretical and cognitive analyses were made that should, in turn, result in eliminating the above-mentioned research gap. The questions are as follows:

1. In what way is the concept of value reflected in the concept of sustainable development?
2. On what foundation should the imperative of value creation within the organisation activity be based?

How do we gain a consensus between the pragmatic expectations of investors concerning the maximisation of the economic capital value and the need for preserving moderation referring to the level of risk-taking by managers without treating the concept of value-based management as a kind of financial perpetuum mobile?

The needs related to achieving the aim of the article and providing answers to the formulated research questions constitute the criteria according to which the research methods were chosen. Taking into account the conceptual nature of the article, the analysis and critical evaluation of the book as well as the literature relating to the subject matter were used in the first place. In particular, this applies to key books in the field of development economics, philosophical, and economic value theory, sustainable development, value-based management, and the impact of the concept of social responsibility on shaping the development and value of the enterprise. The results of the conducted analysis became the basis for the synthesis. Current articles were also used that referred to the conditions, limitations, and effects of implementing both the concept of sustainable development and the concept of value-based management. The use of primarily deductive reasoning as well as inductive reasoning enabled us to formulate qualitative conclusions resulting from our literature review as well as the results of our own research and secondary research. Taking into account the pragmatic nature of the management science in the article, a normative approach based on formulating standards and recommendations for

business practice was also used. This also highlights the application values of the article. As a result, it allowed us to answer the research questions (thus, the aim of the article).

## LITERATURE REVIEW AND THEORY DEVELOPMENT

### Sustainable Development: Concept and Idea

The paradigm of sustainable development that has been present in the environmental, social, and economic aspect of life for more than 30 years is indicated as a real fact, inscribing in and even co-shaping the current stage of the civilisational development of mankind (Egelston, 2013). The above-mentioned problems are part of the issues discussed within the frameworks of the economy of development[1] concerning especially those theories that are regarded as second-generation theories. Within the research on economic changes in reference to those theories, the importance of the qualitative factors of a non-economic origin has been underlined[2]. Social goals is underlined and the good, both of an average man and especially social groups regarded as 'economically handicapped', constitutes a value with simultaneous bearing in mind to preserve the rules of economic effectiveness both in the micro and macro-economic dimension[3]. The theories of the economy of development may therefore be treated as the foundations for building the concept of sustainable development.

In their attempt to thoroughly and multidimensionally analyse the literature of the subject, the authors nevertheless decided not to present the historical analyses or the evolution of the views concerning the concepts of sustainable development and the tools measuring it, being aware of the fact that this topic has been fairly well-described in the subject literature and also taking bibliometric analyses into consideration (for instance,

[1] Among the doctrines of supporting the development, one can notice that these theories are both abundant and in many cases contradictory, which causes them to be perceived as not one consistent system on the required shape of an economic system. It is nevertheless possible to distinguish the following theories (Dobrescu, Hristache, & Iacob, 2012):
- the theory of economic growth comprising the post-Keyenist current (Robinson, Harrod, Domar, Kalm, Kaldor, or Bombach) and the neo-classical (the works of Meade, Solow, and Swan),
- economic development (especially Schumpeter), and
- the development of poorly economically developed countries (Bentham, Nurkse, Myrdal, Rostow, Rosenstein-Rodan, and Chenery).

[2] The main problems of the theory of the economy of development of the first generation concentrate around the accumulation of capital as the preliminary and sufficient condition for development (assuming that some part of this capital must come from outside sources as some kind of external aid or foreign investment) Among these theories, it is worth enumerating the following:
- the 'big-push' theory by Rosenstein-Rodan (see Kreickeiemier & Wrona, 2017),
- the theory of balanced growth by Nurkse (see Kattel, Kregel, & Reinert, 2009),
- the strategy of economic development by Hirschman (see Ellerman, 2004),
- the theory of economic development with unlimited supplies of labour by Lewis (see Wang & Piesse, 2009) or
- the stages of growth theory by Rostow (see Solivetti, 2005).

As far as the theories of the economy of development of the second generation are concerned, another approach can be observed among its representatives. They are institutionalists (Ayres, Veblen, Commons), structuralists (Prebisch), or the supporters of the school of dependencies (Singer, Preibisch). In these theories, the way in which the problem of development is perceived has changed, taking into consideration the areas being of a non-economic character (especially social issues).

[3] The suggested strategies in this respect are the strategy of basic needs and the strategy of fighting poverty, creating new places of work, domestic product redistribution, and grass-roots development.

Pulgarín, Eklund, Garrote, & Escalona-Fernández, 2015; Bettencourt & Kaur, 2011; Cairns & Martinet, 2014; Dahl, 2012). Instead, they try to present the essence of sustainable development in the context of the issues connected with creating values in organisations, showing the mechanisms of changes at the same time and presenting their own proposals connected with the discussed topics.

A good command of the subject literature also makes it possible for the authors to characterise sustainable development as a science by presenting the views of its main representatives, starting with the ones radically opting for social justice and preserving the natural environment (the supporters of Eco Socialism, socio economy, feminist economy, or the so-called deep economy) and finishing with those who are supporters of corpo-capitalism, as well as those whose efforts aim at creating capitalism with a human face (the supporters of making capitalism less green) or even apostates with Daly as their leader.

To sum up, one can claim that the implementation of the concept of sustainable development requires some kind of consensus between three ideological and political fields:

- ecologism connected with durability,
- a political system warranting social justice, and
- an economic system that ensures economic growth but without violating the fields proceeding it.

The authors of the publication are of the opinion that the layout (the position) of these three elements should be arranged in a suitable ranking. This issue is discussed later in this publication.

In spite of the lack of doubts in practical terms as for the need to implement the concept of sustainable development as well as the necessity of the co-awareness in its creation in theoretical terms, its full realisation is questioned (Borys, 2011). Some researchers who deal with the subject of the contemporary development of the world point to the permanence of changes and the omnipresent state of imbalance as a common phenomenon and even established in today's reality. They ask how we can talk about balance if the state of imbalance is a natural state. In this context, however, a question arises: is it really a natural state or only the one observed/occurring at the present stage of world development?

On the other hand, other researchers point to sustainable development as a well described paradigm that is not only a general idea or a vaguely defined one (e.g., Borowiecki & Siuta-Tokarska, 2018; Olawumi & Chan, 2018; Sinakou, Boeve-de Pauw, Goossens, & Van Petegem, 2018). When comparing these two contradictory statements, it seems appropriate to look at self-regulating systems. Natural sciences are going towards exactly such a view of the problem. Therefore, as Piątek (2007) rightly observes, 'healthy ecosystems ... owing to natural homeostatic systems, regulating the circulation of matter and energy ... stay in the state of permanent, sustainable development. If they become unbalanced, they are able to return to the balance as long as they have a sufficient level of biodiversity. Natural ecosystems do not need awareness to react to changes in the environment in a sustainable manner.' Also, a human being is not an alienated creature but one living together with the environment of which he is a part and that he changes at the same time. In this aspect, a problem occurs concerning the geographical and time dimension of the reflection over the use of the existing resources of the Earth by man. The geographical dimension refers to the internationalisation and globalisation processes that make the level of co-dependence among different locations as related to the exploitation

and use of natural resources increase rapidly. The time dimension concerns the progressing intensification of economic activity related to the intensification of the problem of the scarcity of resources and, as a consequence, an inter- and intra-generational balance and justice in the use of those resources (Nilsson, Griggs, & Visbeck, 2016). Considering mankind as a whole, a dilemma occurs concerning the availability of resources that should be shared – both by the present and future generations. The problem of shared resources discussed in the deliberations by Lloyd (the metaphor of a pasture and its use by shepherds increasing their herds whose actions that are seemingly effective in the short-term result in limitations and a lack of effectiveness for other users and for themselves in the long-term) and then developed by Hardin (see Walker, 2009 and Ostrom, 2015) highlights the need for the real activation of activities with regard to natural resource management (that is, the globe). This need must, however, be fulfilled in the multi-generational dimension; thus, it requires the use of resources in such a way as to optimise the relative effects but from the point of view of the wealth of future generations as well and not only of the present generation. Such a view of the issue of using natural resources is nothing new. However, in spite of announcing as early as 1987 (under the auspices of the UN of the so-called Gro Harlem Brundtland Report), the problem is not solved, but increasing imbalances in the natural, social, and economic capital occurring as a whole (Borowiecki & Siuta-Tokarska, 2018) are still an issue to be resolved. Therefore, a question arises:

Why, despite the good will of the representatives of the governments of the world's countries and international institutions (UN), does mankind still keep going downhill, not implementing tasks arising from the concept of sustainable and permanent development that was defined more than 30 years ago?

It seems that this state of affairs is caused by a misunderstanding and lack of the actual implementation of 'values' in socio-economic life superior to the natural world but being the *sine qua non* condition for the existence of life as such.

## The Term of Value and Sustainable Development in the Aspect of the Functioning of Enterprises

In the philosophical approach, value is the basic axiological category standing for everything that is valuable and desirable and what constitutes the ultimate goal of humans. Value can be understood and determined both in reference to the object itself as well as its qualities and the idea (Hartman, 2011).

The term value itself (Latin: *valor*) comes from the term 'be valuable' derived from philosophy and being the object of axiological research; that is, studies about values (Biddle & Schafft, 2015). As a philosophical discipline, axiology in particular includes studies on:

- the essence of value (*valor* as the major quality of any value and as an idea),
- types of values (biological, aesthetic, scientific, ethical, absolute, and relative values),
- conditions of the cognition and realisation of values,
- structure and the manner of the existence of a value,
- hierarchy and volume of a value,
- autonomy and objectivity of values[4].

[4] The broad sense of value as a philosophical category was presented by outstanding Polish philosopher Ingarden, among others.

There is an ongoing dispute among philosophers concerning the understanding of value with regard to objects in the objective or subjective approach (Biedenbach, 2016). Objectivists approach value as a quality inherent to the entity/phenomenon irrespective of a subjective assessment made by a specific entity in accordance with a given point of view, whereas subjectivists understand it as a quality assigned to an object/phenomenon by an entity, revealing only specific emotional and volitional attitudes[5] with regard to the evaluation. According to contemporary philosophy, a kind of a compromise assumes that values stand for the attitude of the acting individual to a given object, which is related to the belief that the object directly or indirectly fulfills his needs; it is subjective in this approach, but it has an objective aspect at the same time since value depends on the potential properties of a given object.

As can be observed, 'value' means the property of an object or an object possessing this property[6] – only a positive property or a positive or negative property; the property has either a special economic significance or a broad philosophical one. An important aspect of the indicated understanding of the notion of value is distinguishing two types of value – this desired one (namely, the positive value) but, at the same time, one that can be defined as a negative pejorative one (which is defined as an anti-value[7]). In the literature of the subject, we can also indicate the isolation of values felt, declared, and recognized. Considering the systematic division, Ingarden indicates their three groups: vital, cultural, and moral values (Gabrusewicz & Przybylska-Kapuścińska, 2013).

On the other hand, by taking into account the aspect of experience, one can notice a transition of the civilization of the turn of the 20th and 21st century into the so-called 'liquid modernity' (Bauman, 2000), the core of which is the lack of rooting (identity, values) and the absence of real borders (geopolitical → communication→ trade → consumption). Hence, the notion of liquid modernity may be characterised by variability, relativity, and pluralism, all of which 'deprive practically every single being of its value.'

Assuming that values escape their descriptive definition, what should be indicated is the understanding of values as a specific pattern that requires realization in human action. In a similar way, we should look at the problem of sustainable development in the context of the three capitals included in it (namely natural, social, and economic ones) as a concept requiring a new philosophy of a deed and the deed itself.

As it is correctly emphasized by Piątek (2007), philosophy 'wants to establish the human world, seeing the specificity of a human in his symbiosis with nature, and not in the opposites occurring between them.' Therefore, it is related to the understanding that mankind is rooted in nature with pressure put on biocentrism as a new model of man's attitude towards nature with the simultaneous opposition to the attitude of arrogant anthropocentrism (Piątek, 2007).

The realisation of the sustainable development concept requires an attitude towards the process of its implementation (Siva, Gremyr, Bergquist, Garvare, Zobel, & Isaksson, 2016) that will be consistent and at the same time filled with the power of idea and can, moreover, be indicated itself as a value for which the mankind of the 21st century strives

[5] Volitional – that is, dependent on the will.

[6] In this context, Tischner uses the definition 'the object that is entitled to any values' (see Tischner, 2002).

[7] On the grounds of axiology, assigning a specific sign to a value refers to perceiving it from the perspective of existential judgments.

(as opposed to the ubiquitous liquid modernity). In this aspect, the notion of value is an integral part of the concept of sustainable development, creating a value by the fact of its existence as an idea in this concept.

Philosophical considerations pertaining to the essence and conditions of shaping values were an important starting point for the formation and development of the economic value theory. The basis for the development of the economic value theory were the works by Smith (2007), Ricardo (2001), and Say (2001), who defined and conceptualised such basic concepts as exchangeable value, value in use, natural value, and reproductive value. This created the basis for the further development of the theory of value and its use as related to the processes of the functioning and development of enterprises. A business's understanding of value is based on the concept of economic value related to the ability of economic resources to generate economic benefits resulting from their effective use, leading to the multiplication of value of the invested capital (Mayfield, 1997). In this context, value and its creation can be considered in the enterprise's operations from three perspectives:

- from the management perspective, where the maximisation of market value as the enterprise's goal and the purpose of corporate governance and the basis for assessing its effectiveness are of key importance,
- from the perspective of accounting, which is a system for measuring economic values characterising the activities of the enterprise and the value of its assets, equity, and liabilities,
- from the business valuation perspective, where the concept of asset-based value and the concept of income-based value are the basis of the enterprise's valuation methods as well as the value and valuation standards.

It should be stressed that the concept is multidimensional and at the same time dynamic, which brings specific consequences in its implementation, including the problems and dilemmas occurring and concerning measures as well as defining the value of such measurements itself (Palea, 2018; Hak, Janoušková, & Moldan, 2016).

What results from the research conducted by the Center for Business Excellence in the Farmer School of Business at Miami University and Crowe Horwath LLP is that the majority of business leaders are convinced of the strategic value for the organisation on account of sustainable development initiatives. However, what is challenging to them is data reporting, as there are no unanimously defined methods of their measurement.

One of the possibilities used by businesses to report their activity is preparing such reports based on the guidelines of the International Integrated Reporting Council (IIRC) as well as the indicators of the Global Reporting Initiative (GRI). The indicators proposed by the GRI are divided into the following segments (Szejnwald-Brown, de Jong, & Levy, 2008; Tarquinio, Raucci, & Benedetti, 2018):

- strategy and analysis,
- profile of the organisation,
- identification of significant aspects and scopes,
- engagement of stakeholders,
- profile of the report,
- supervision,
- corporate governance,
- ethics,

– detailed indicators, including the following:
  - information concerning attitude towards management,
  - economic indicators, including economic results, presence on the market, indirect economic influence, and buying practices,
  - environmental indicators, including materials/raw materials, energy, water, biodiversity, emissions, sewage and waste, products and services, compliance with regulations, transport, general, assessment of the supplier's environment, and complaint mechanisms concerning environmental issues,
  - social indicators, including hiring practice and dignified work, human rights, society, and responsibility for the product.

Applied business practices should contribute to the growth of the value of a given business entity (influence on economic capital) and support the fulfillment of the needs occurring with regard to natural and social capitals (see also Ikemefuna, 2016). An increase in the value of a business entity is therefore discussed in activities that can be presented by means of three key factors of sustainable development on the firm's level while setting its environmental, social, and economic goals at the same time (Moldavska & Welo, 2019; Dhahri & Omri, 2018):

1. The ecological (environmental) factor, which first strives to minimise the negative impact of the company's activities on the environment and natural resources and then affect a positive influence (initiatives and activities restoring the natural state of the environment).
2. The social factor, which is manifested through a positive influence on society's cooperation with both the employees and the local community. It should be done by creating or taking part in social programmes of this type as well as launching initiatives for pro-social activities, such as raising the awareness of human rights and workers' rights, as well as propagating ethical activities and responsibility for the products/services sold.
3. The technical and economic factors, whose main assumption is increasing the safety of the entity's employees while maintaining the simultaneous growth of the economic effectiveness of the enterprise related to the application of modern pro-environmental technologies.

An important issue in the context of reporting the accomplishment level of sustainable development by enterprises is the problem of the implementation (Moratis & Melissen, 2019) of this type of activity' practically exclusively in large and very large economic entities, with the omission of the SME-sector enterprises (Lortie, Nadeau, & Vezeau, 2016), whose number in the world economy is the largest in terms of quantity. Therefore, the need for these types of activities in smaller entities is indicated as well, with the consideration to the specificity of their activity and size class. In the opinion of the authors of this publication, the implementation of the sustainable development concept should have a bottom-up character (regardless of the top-down activities on the part of the state), starting from the smallest market participants up to the largest ones. Only the full awareness and sensitisation to this issue of all of the participants of this process can bring the expected changes.

As Gabrusewicz and Przybylska-Kapuścińska observed (2013), the following can be indicated among the fundamental problems related to business reporting on the Sustainable Development Goals achievement:

- a lack of the systematisation of terms in sustainable development,
- a lack of capital resources that could support the development of this concept in enterprises,
- a lack of the existence of the standard process of the verification of costs and profits that come from the concept of sustainable development in the enterprise (value measurement).

Regardless of the discussed problems concerning the practical implementation of the concept of sustainable development in enterprises, it should be strongly emphasised that, on the level of enterprises 'the world' is quite often perceived from the perspective of an instrumental value. Such perceptions are then contradictory to authentic responsibility for the business activity of the organisation, as well as for the sustainable development of the enterprise. Hence, what is needed is a new rebuilt imperative of value creation that stands in opposition to the liquid modernity of the contemporary world while at the same time being rooted in the fundamental rule of the restitution of the idea of responsibility for

1. nature capital (as the sine qua non condition of the existence of life in general),
2. social capital,
3. economic capital,

according to the above-suggested rank.

**Imperative of Value Creation versus Models of Functioning of Enterprises**

The contemporary finance theory and firm theory regard the maximisation of the market value as the basic goal of a company activity. It is primarily the consequence of the logic on the basis of which the market economy functions as well as a resultant natural attempt of the capital owners to multiply its value. This corresponds to the assumptions of the financial (investment) perception of an enterprise as a form of investment; therefore, the natural aim of its activity is the growth of its market value (McTaggart, Kontes, & Mankins, 1994). At the same time, the impact of various internal and external factors (including the establishment and evolution of legal forms as well as the types of ownership of enterprises) has brought about deep transformations in the models of the functioning of enterprises.

In the neoclassical model of an enterprise, the attention was concentrated on profit maximisation as the superior goal of its activity, which determined the corporate value in a fundamental way. The model was adequate for the époque of the capitalism of entrepreneurs – owners managing enterprises, who were obviously guided by their pragmatic expectations of the multiplication of the invested capital value while undertaking their managerial activities. The evolution of the types of enterprise ownership that were initiated with the separation of ownership from management and the emergence of non-classical private ownership shaped new enterprise models. These models are related to the following stages of economic development:

- the managerial capitalism era, where managerial decisions were handed over to managers employed for this and natural persons still prevailed in the ownership structures of enterprises. The occurrence of managers as a new group of company stakeholders

arose primarily from the growing complexity of managerial decisions and, therefore, the need for the professionalisation of management,
- the investor capitalism era, which in addition to the separation of ownership and management is characterised by domination of the ownership structures of enterprises by institutional investors, including investment funds, pension funds, insurance funds, and banks; thus, entities in the case of which pressure on the multiplication of the invested capital value arises from the necessity to fulfill the expectations of the customers of the mentioned financial institutions.

The indicated transformations in the models of the functioning of enterprises caused the necessity of a significantly different approach, both to the issue of defining the basic enterprise's aim and the ways of ensuring its effective and efficient realisation. Under these conditions, the pro-value paradigm of management and the relative value-based management concept were formed and developed.

The pioneer contribution to the creation, development, and dissemination of value-based management was primarily made by the following authors:

- in the field of the identification of the premises and assumptions to create the concept: Rappaport (1986),
- in the field of conceptualisation value-based management as a new management concept: Copeland, Koller, and Murrin (1990), McTaggart, Kontes, and Mankis (1994),
- in the field of creating and developing tools for measuring and evaluating the effectiveness of value creation: Steward (1991) and Ehrbar (1998).

During the following years, we continued to find a creative continuation of the above-mentioned authors' achievements in the field of value-based management concept development in the works of Black, Wright, and Bachman (1998), Knight (1998), Martin and Petty (2000), and Young and O'Byrne (2001).

The concept of value-based management binds corporate strategy with the process of managing company finance along with their orientation to making decisions resulting in the maximisation of corporate value. This was supposed to contribute to the integration of the goals of the owners with those of the managers and, thus, to the liquidation of the negative effects that the separation of ownership and management brought for the multiplication of corporate value. At the same time, it set another stage in management science related to its growing financialisation and, thus, the departure from the technocratic approach formed by the authors of this scientific discipline. Financialisation is connected with an increasing role of financial institutions in the processes of managing an enterprise of the non-financial sector, as well as with the growing significance of the capital market as a mechanism of exercising control over an enterprise, among others (Stochhammer, 2013).

Changes within the enterprise functioning models also arose from other parallelly occurring transformations in their ownership structures and relative management mechanisms. This mainly refers to the following:

- the inclusion of state and local government units in the ownership structures of enterprises, which contributed to the emergence of such ownership types as state ownership and communal ownership. At the same time, it brought about changes in the hierarchy of corporate goals related to the exposure of tangible goals connected with the accom-

plishment of important interests of the state and local communities as company stakeholders. It simultaneously required the assurance of the effective allocation of public funds engaged in enterprises in the form of investment capital and subsidies, primarily enabling the accomplishment of important social goals,
- inclusion of employees in the ownership structures of enterprises, the result of which are subsequent types of ownership: employee ownership (based on American Employee Stock Ownership Plans),
- private and local governmental ownership focused on the consideration of coincidentally treated tangible, social, and financial goals.

At the same time, these transformations set the subsequent stages of economic development; namely, state and local government capitalism as well as stakeholder capitalism. These stages are related to the growing influence of increasingly broader groups of internal and external stakeholders on the functioning of the enterprise.

**A Need for Changes in the Concept of Value-Based Management**

The experiences derived from the practice of implementing the value-based management concept in the 1990s and at the beginning of the 21st century also showed the weaknesses of this concept as well as the potential threats that may result from it for the effectiveness of corporate value creation. A broad discussion on this referred primarily to the following:
- understanding the essence and mechanism of the concept functioning and the method of using partial and summary measures of corporate value creation within it (Smith, 2009),
- complexity and conditionings of the concept implementation (Starowic, Cooper, & Davis, 2004).

The need for a deeper penetration of weaknesses of the value-based management concept was exposed by the latest economic crisis. The experiences derived from that crisis stressed the need for the introduction of significant changes in the area of the concept's use, referring mainly to the problem related to the measurement of the effectiveness of corporate value creation and the influence of the mechanism of corporate governance.

The essence of the value-based management concept makes the measurement of the effectiveness of corporate value creation play a crucial role from the point of view of the concept's fulfillment of the expectations formulated towards it. As a new group of enterprise effectiveness measures, market measures were intended to enable both the measurement of the partial effects of corporate value creation as well as create conditions to show the influence of these effects on this value. However, the lack of established patterns and standards referring to the selection and use of these measures also enabled the creation of an untrue image of the enterprise and its financial condition as a result of data manipulation and the use of gaps in accounting principles – including the methods of measuring the economic volumes that characterise the activity of an enterprise (Reichmann, 2016). At the same time, it has brought about numerous dysfunctions in the business value measurement we often deal with in the contemporary economy 'contaminated' by the phenomenon of excessive financialisation manifested in the detachment of financial flows from real processes (Stockhammer, 2013). It has also contributed to the growth of the phenomenon of asymmetry of information among management boards of enterprises and their owners and investors as well as credit institutions. This creates the

need for a significant reorientation of our accounting paradigms. It should tend toward the development of patterns and standards adjusted to the changed reality and relative new information needs and, at the same time, create mechanisms protecting us from the negative consequences of creative accounting.

The global economic crisis also proved the inefficiency and ineffectiveness of many supervisory and regulatory mechanisms that should accompany the value-based management concept and constitute an integral component of corporate governance. An important premise for the creation and conceptualisation of value-based management was the need for a search for tools integrating the goals of the owners with the goals of mangers in charge of enterprises, which under the conditions of the separation of ownership and management brings a number of negative consequences for the effectiveness of corporate value creation (defined as an 'agency problem'). At the same time, the agency theory of enterprise is widely used as a perspective of describing the essence and mechanisms of corporate governance, which implies the need for linking the issues of the effectiveness of corporate value creation to the problem of corporate governance (Cornelius & Kogut, 2003). Corporate governance mechanisms (and the ownership supervision within it) should prevent a situation when the blind faith of investors in unlimited possibilities to obtain higher and higher return rates becomes a factor stimulating the phenomenon of the detachment of the corporate value category from its fundamental bases and favors excessive behaviourism in its assessment, which may lead to tremendous perturbations in the functioning of the financial market. The mechanisms should also limit the voluntarism of managers, which is deprived of any rational premises (since managers undertook unjustifiable risks expecting higher and higher profits).

## New Imperative of Value Creation and the Concept of Sustainable Value-Based Management: In Search of Economic Reason and Moderation

The global investor capitalism era and the experience derived from the consequences of the economic crisis at the beginning of the 21st century brought about the necessity of changes in respect to understanding and the way of using the value-based management concept. In this context, Porter and Kramer (2011) called for the need to redefine the basic goal of the enterprise, which they defined as creating shared value. The shared value concept exposes a wide group of internal and external stakeholders of a company as beneficiaries of the effects of creating its value. At the same time, it should be noted that, although originally oriented to multiplying the wealth of shareholders, the concept of value-based management is exhibited by the fact that the objectives of shareholders must be done at the expense of its depletion for the other stakeholders. On the contrary, the financial success of owners also creates conditions for an increase in value for other groups. Effective enterprises create new jobs and financial incentives for employees, pay higher taxes, and are reliable and desirable clients for banks and contractors for cooperators. At the same time, such an assertion suggests that enterprises create value for their owners only when value is created for other stakeholders at the same time. Therefore, the theory of stakeholders equates the goal of the company's activity in the first place with the creation of values for its internal and external stakeholders, noticing the broad social context of the functioning of business entities.

Taking into consideration the postulates of the concept of sustainable development and the benefits it brought from the point of view of the efficiency and sustainability of

enterprise development, it seems logical to use these achievements for the needs of formulating a new imperative of corporate value creation and the postulate of the evolution of the value-based management concept towards sustainable value-based management. At the same time, the concept is the manifestation of the coincidence of the value-based management concept with the sustainable development concept and corporate social responsibility concept (Martin, Petty, & Wallace, 2009). A hybrid character of the mentioned management concept is the reason for which its ideological foundation links the pro-value paradigm to the sustainable development and management ethics paradigms. The concept reflects a new approach to management, where the achievement of social goals is closely related to the achievement of economic goals and social responsibility coexists with responsibility towards the enterprise (Igwe, Icha-Huma, & Madichie, 2018). Therefore, such an approach refers to the foundations of the corporate governance theory, referring to two models of the enterprise (the financial and social ones) and exposing varied beneficiaries of the effects of corporate value creation (Cornelius & Kogut, 2003).

The concept of sustainable value-based management orients the enterprise's management system to attempt to maximise its market value while maintaining economic reason and moderation. The mentioned features relate primarily to such groups of stakeholders as owners and managers. As investors, the former should possess moderation in the formulation of the expectations related to the rate of capital multiplication – the required rate of return. Making key decisions affecting the use of capital, the latter should take a reasonable risk in the sense of responsibility for the long-term development of the enterprise and business continuity.

On this occasion, we can also see a return to the roots of the value-based management concept. Initially, the value-based management term referred to a management system focused on the provision of value for a broad group of company stakeholders (particularly the owners, employees and customers) being guided by the basic principles of economic and social justice. However, broad dissemination of the mentioned term in the circles of American business was the reason why it has only been associated with and used in the context of the multiplication of the enterprise market value and the wealth of its owners since the end of the 1980s. Its primary meaning was then replaced by the term 'justice-based management' as a management concept based on the idea of economic and social justice (Miller, Greaney, & Brohawn, 1994).

## CONCLUSIONS

The concept of value-based management was formed as a result of the evolution of pro-value management due to changes in the internal and external conditionings of the enterprise functioning and experiences derived from the latest global economic crisis. It also positively responds to the formulated postulate of linking the issues of the effectiveness of corporate value creation to the problems of corporate governance through the examination of the corporate value creation process in a broad perspective of shared value creation whose beneficiaries are its various stakeholders. The proposed concept of sustainable value-based management is also inherent to the idea of the economics of moderation based on the creation of mechanisms for balancing economic streams and resources to maintain a dynamic balance, guaranteeing stable long-term economic growth (Kolodko,

2017). Referring the assumptions and postulates of the economics of moderation to effective corporate value creation, we must say that investors should keep their own common economic sense in formulating expectations referring to the speed of the capital multiplication value, and managers should take risks within reasonable limits, not treating the value-based management concept as a financial *perpetum mobile*. This also leads to the conclusion that the reasonable profit concept referring to the assessment of the effectiveness of enterprises belonging to regulated sectors (Narmania, 2018) can also be the basis for the formulation of the postulate of a 'reasonable speed of corporate value creation.' Stakeholders of the enterprise (particularly its owners and managers as well as its potential investors) should perceive the process of multiplying the value of invested capital as a process of the sustainable creation of value in the long-term – without exposing the enterprise to excessive and unreasonable risk. Responsibility for the existence and sustainable development of an enterprise also requires a redefinition of the imperative of value creation, taking into account the necessity of sustainable use and multiplication of the enterprise's resources and not merely the blind pursuit of obtaining immediate benefits.

Taking into consideration the research subject concerning the problems of creating values in business organisations as well as the problems of sustainable development, some limitations connected with the above-mentioned issues have been displayed. These limitations appear due to the fact that the authors attempted to perceive the research area holistically; hence, the necessity for looking at it from the broadest possible perspective appears. The theoretical research in this respect concerned business organisations that are seen as a part of the economy sector; hence, making any generalisations from the conceptual digressions is extremely difficult. This difficulty results from the differences among organisations, such as their size classification (from micro to large entities), their range (from local to global markets), or their type of business activity (the service, industrial, or trade sectors). This means that the implementation of a new imperative of corporate value creation and the concept of sustainable value-based management (regardless of the general frame or base presented in the article) will require it to be filled with content that will, in turn, be fitted to the above-mentioned specific features of business organisations.

Further research should be led in the context of contemporary economic doctrines and the nature of 21st-century capitalism. Such research could reveal the possibilities of implementation of the idea of sustainable development, taking into account the need for the sustainability of this process in the long term.

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## Authors

The contribution share of authors is equal and amounted to 50% each of them.

**Andrzej Jaki**
Associate Professor at Department of Economics and Organization of Enterprises, Cracow University of Economics, His research interests are in value-based management and business valuation.
**Correspondence to:** prof. UEK dr hab. Andrzej Jaki, Cracow University of Economics, Department of Economics and Organization of Enterprises, ul. Rakowicka 27, 31-510 Kraków, Poland; +48 12 293 53 30; andrzej.jaki@uek.krakow.pl
**ORCID** http://orcid.org/0000-0002-4799-4343

**Barbara Siuta-Tokarska**
Associate Professor at Department of Economics and Organization of Enterprises, Cracow University of Economics, Her research interest include enterprise development, especially SMEs; sustainable development; development management.
**Correspondence to:** prof. UEK dr hab. Barbara Siuta-Tokarska, Cracow University of Economics, Department of Economics and Organization of Enterprises, ul. Rakowicka 27, 31-510 Kraków, Poland, +48 12 293 74 37, siutab@uek.krakow.pl
**ORCID** http://orcid.org/0000-0001-9078-6243

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# China and Central and Eastern European Countries within ’16+1’: Group or Bilateral Relations?

**Andreja Jaklič, Marjan Svetličič**

**ABSTRACT**

**Objective:** The article focuses on developments within the ’16+1’ initiative: It aims to analyse whether the relations between China and CEECs are more multilateral or bilateral in nature and discuss the implications for business.

**Research Design & Methods:** We review the literature on the ‘16+1’, overview international trade and investment between CEECs and China, development of institutional framework and examine the case of China-Slovenia economic relations in greater detail.

**Findings:** Highly intensive diplomatic relationships since the establishment of the initiative in 2012 have evolved into deeper, though unbalanced economic relations, resulting in net trade deficit and high concentration in trade and investment.

**Implications & Recommendations:** Formally multilateral platform, ‘16+1’, kept the trade policies and business strategies predominantly still within bilateral relations strategies of national countries. Multilateralising the ‘16+1’ remains an opportunity for CEECs and the EU. Secondly, in most countries strong bilateral cooperation with China is a part of efforts to diversify their international economic cooperation and a catching up process parallel with the growing role of China in the global economy.

**Contribution & Value Added:** Monitoring trade and investments between CEECs and China provides insights to describe CEECs patterns of economic globalisation, institutional framework for entrepreneurship and information how the ’16+1’ has influenced globalisation patterns in the EU trade and investment, rethinking of EU-China cooperation and competition and cooperation among CEECs.

**Article type:** research article

**Keywords:** CEE; 16+1; China; trade; FDI; trade policy; One Belt One Road

**JEL codes:** F13, F21, F23

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## INTRODUCTION

The new reality of tectonic changes in the global economy, increasing importance of emerging economies and structural changes transforming trade in a more intra-firm trade within global value chains influenced trade and investment policy changes in Central and Eastern European countries (CEECs). They also stimulated a new generation of trade and investment agreements generated as part of China's major globalisation Belt and Road Initiative (BRI) initiative. Their role in trade liberalisation and the distribution of costs and benefits is dramatically changing due to the changing structure of global trade with an increasing role of services and low level of tariffs on manufactured goods (Rodrik, 2018; Baldwin, 2011). One of such innovative approaches to regional cooperation, established in 2012, is the '16+1'[1]; the initiative that serves China's vision to increase its political influence in the world and on CEECs by promoting China-European Union (EU) relations. The '16+1' initiative is regarded by Chinese as 'one of the most important achievements of China' (Tianping, 2017; Pepermans, 2018). It can be regarded as part of One Belt One Road (BRI), a major long term China strategy of materialising China's advantages in the world, which aims to facilitate economic development in a vast region covering sub-regions in Asia, Europe and Africa and promote greater integration among the 60-plus countries along the Belt and Road (Huang, 2016). 'CEEc, providing a strategic link between Asia and West Europe, are vital to the success of the BRI' (HKTDC, 2016, p. 2).

Such cooperation supports core strategic Chinese interests in strengthening relations with the EU. The '16+1' has brought change, together with both great expectations and concerns. China may utilise the scheme for political gains. 'Some CEECs reiterated their ability to serve as China's gateway to markets in the EU, the world's largest economic block' (Tianping, 2017). It can be materialised through such a 'soft belly' of the EU, some say. 'Not surprisingly the EU has the lukewarm and reserved stance towards the '16+1' China-CEE cooperation' (Turcsányi, 2017). Some claim that 'the '16+1' scheme is a part of broader divide and rule Chinese policy' (Godement & Vasselier, 2017, p. 65), while others do not agree that 'European concerns over China's political objectives are justified'[2] and claim that so far they see little evidence of a strategic attempt on China's part to 'divide' CEECs from the rest of the EU (Hellström, 2016; Pepe, 2017). New formal 'friends' of the '16+1' (like Portugal from 2018) are increasingly likely. China has, on the other hand, also taken some risk and started developmental initiative, since CEECs still represent a region with a relatively slower catching-up process within Europe.

[1] The '16+1' format is an initiative by the People's Republic of China aimed at intensifying and expanding cooperation with 11 EU Member States and 5 Balkan countries (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Montenegro, Poland, Romania, Serbia, Slovakia, Slovenia) in the fields of investments, transport, finance, science, education, and culture. In the framework of the initiative, China has defined three potential priority areas for economic cooperation: infrastructure, high technologies, and green technologies. The initiative was inaugurated by the first 16+1 Summit held in Warsaw, Poland, in 2012.

[2] There are two main concerns. First, China may intensify efforts to use the influence it is building in CEECs to frustrate aspects of the EU's common China policy. Second, some 16+1 countries may use strong ties with China to buttress negotiating positions against Brussels, such dynamics could undermine Brussels' effectiveness in often fractious relations with its second-largest trade partner. One concern is that China's push for guaranteed contracts for its companies will undermine the EU's single market rules on public procurement.

Since 2012 developed world economies have experienced a relative stagnation in the value of their trade in goods, while China has continued progression as one of the world's leading trading nations. Its share in the world exports for goods and services rose from 9.0 per cent to 13.6 per cent during the period 2006-2016, while its share of imports grew at an even faster pace, increasing by 4.9 percentage points to reach 12.0 per cent in 2016 (Eurostat, 2017c, p. 28).

Political relations between China and CEECs were recently more intensive than with any other region. High frequency of '16+1' summits was accompanied by a number of lower-level gatherings, several sectoral coordination mechanisms across CEE and local cooperation between CEECs and Chinese cities and provinces. However, the general assessment after five years of existence was often summed up as '*hot politics, but cold economics*' (Turcsanyi, 2017). The initial expectations – to reach USD 100 billion trade by 2015 – were not achieved; in 2017 trade in goods reached EUR 57.3 billion, only 10 per cent of the total EU-China trade.

The initiative has been thus evaluated as '*work in progress*' (European Parliament briefing, September 2018) and closer monitoring has started from both CEE countries within the initiative and a rising number of external observers. The Chinese influence in the CEE region – '*chinfluence*'[3]-is getting increasing attention. Discussions on the effects of cooperation and calls for a more balanced trade and reciprocity of market access emerged (among CEECs, the EU and observers) more intensively after the 2018 Sofia Summit. The EU, as a 'traditional observer' gets accompanied by Austria, Belarus, Greece, Switzerland, the European Bank for Reconstruction and Development. The fear is that the '16+1' is threatening the EU's one voice strategy in its relationship with China and Western Balkan membership 'candidate' countries, the impact on the EU's internal political dynamics and the process of catching-up new CEE members in their economic development with the 'old' EU Member States. Next, changes in institutional frameworks are also influencing entrepreneurial activity.

This contribution aims to identify trends and (potential) changes in institutional framework and economic cooperation between CEECs and China, which are relevant for entrepreneurship theory and practice. Monitoring trade and investments in CEECs provides insights to describe their patterns of economic globalisation and information on how the '16+1' has influenced globalisation patterns in the EU trade and investment. Our hypothesis is, that formally multilateral platforms, such as '16+1', kept the trade policies and business strategies predominantly still within bilateral relations strategies of national countries. Secondly, in most countries strong bilateral cooperation with China is a part of efforts to diversify their international economic cooperation (originating also from entrepreneurial initiatives) and the catching up process parallel with the growing role of China in the global economy. Using a multilevel and mix method approach we firstly review bilateral trade and investments of CEECs with China. Next, we examine the case of China-Slovenia economic relations, a country placed at the periphery of the '16+1' platform, but strongly connected with trade and investment in the EU and top innovating country among CEECs. In conclusions we sum up findings and implications.

[3] Chinfluence is a new project dedicated to analysing the Chinese impact in the region, mirroring similar research undertaken by think-tanks in the EU Member States not part of the 16+1 format (http://www.chinfluence.eu/)

## MATERIAL AND METHODS

We review relatively scarce literature on the '16+1' and proceed with an overview of developments in international trade and investment of CEE with China. Analysing economic links between CEECs and China does not extend beyond trade and investment transactions into other domains, which may be impacted by '16+1', such as cultural relations, economic migration, income distribution or wage developments, financial flows, the application of information and communication technologies, environmental impacts or geopolitical aspects. The overview of formal institutions is, however, added. To capture the extent and diversity of CEE-China cooperation we use a multilevel and mixed method approach; the regional perspective of macro data is complemented by a case study of bilateral relations. Exploring the diversity of bilateral relations within the '16+1' framework and a case study of bilateral relations can improve the understanding of Chinese engagement in CEE. It can also explain the creation and functioning of the '16+1' platform, which is essential for understanding the Chinese foreign (trade) policy, an influence on entrepreneurial activity and business strategies of CEE firms.

The regional comparative overview is based on the Eurostat data, as 11 of countries within the 16+1 initiative are the EU-members (CEE-11) and five of them are Western Balkan countries, among them the EU candidates and potential candidates. The data draws on information from Eurostat's online database; based on the European Statistical System (ESS) and the European System of Central Banks (ESCB), as well as other official international sources, the United Nations (UN) and the World Trade Organisation (WTO).

A case study on China-Slovenia economic relations presents an example of a smaller peripheral country – of both the EU and the '16+1', but ranking high in innovation and trade integration. As such it can demonstrate the developments 'of a hub and spoke' effects of the '16+1'. The analysis uses multiple sources, such as the Bank of Slovenia, the Ministry of Finance and the Slovenian Chamber of Commerce, while we examine entrepreneurial barriers and problems by reviewing interviews and surveys carried by the Chamber of Commerce and some specific research (Raškovič, 2018; Polajžer & Turk, 2013; Ivančič, 2009).

## LITERATURE REVIEW

The pace and the scale of China's economic transformation have no historical precedent (Zho, 2012, p. 103). Its economic growth of the previous three and a half decades was based on several key factors: a sequence of market-oriented institutional reforms, including openness to international trade and direct investment, combined with low wages and a favourable demographic structure (Wei *et al*., 2017). China has made tremendous changes in production, but also in the volume and structure of global trade in the last decade. The biggest change in the structure of global exports of goods was an expansion in the share of Chinese exports, which rose from 11.0 per cent of the total value in 2006 to 17.0 per cent by 2016. In 2016, China became the leading exporter of goods (EUR 1.9 trillion), while the United States was the largest importer of goods (EUR 2.0 trillion). In both cases the EU-28 occupied the second position, with both exported and imported goods valued at EUR 1.7 trillion. The EU-28, China and the United States have been the three largest players in international trade of goods since 2004 (when China outperformed Japan). In 2007, China surpassed the United

States as the second largest exporter of goods in the world and this pattern was reproduced again in 2014 when China overtook the EU-28 to record the highest share of exported goods, a position that was maintained in 2015 and 2016 (Eurostat, 2017c). In 2016 the EU adopted a new strategy on China (EC, 2016) promoting reciprocity and fair competition across all areas of cooperation. The strategy also includes a trade agenda with a strong focus on improving market access opportunities, including negotiations on a Comprehensive Agreement on Investment. It is also calling on China to engage with ambition at a multilateral level. China is now the EU's second-biggest trading partner following the United States and the EU is China's biggest trading partner. China and Europe trade is on average over EUR1 billion a day, bilateral trade in services amounts to more than 10 per cent of total trade in goods, and the EU's exports of services make up 19 per cent of the EU's total exports of goods. The EU has currently a trade deficit with China, however the EU's overall trade balance is positive.

Firstly, we examine the developments and diversity within the '16+1' and proceed with a case study of China-Slovenia cooperation.

**Developments and Diversity in '16+1'**

China engaged 16 CEECs under the '16+1' cooperation in 2012 when the consequences of the 2008 financial crisis were still strongly present in the region. CEECs enthusiastically embraced this form of cooperation as a chance to diversify their EU-focused economic relations and strengthen the resilience of their economies to 'next' crises. The '16+1' format, considered CEECs' advanced stage of development and evolved in a slightly different way from other China-led regional platforms. The idea of a multilateral approach and multilevel governance is manifested in high frequency of '16+1' summits[4] along with a number of lower-level gatherings, several sectoral coordination mechanisms across CEE and local cooperation between CEECs and Chinese cities and provinces. Over the last five years, the frequency of multi-level and sector-specific meetings or other consultations has increased. Nevertheless, China has kept intensive bilateral ties. '*Looking for the future, the bilateral cooperation under the framework of the '16+1 Cooperation' still has huge potential and opportunities and will be one of the major points of growth*.' (Ping & Zuokui, 2017, p. 6). Most of the actual business though is transacted bilaterally, like in FOCAC and summits are largely venues for strings of bilateral meetings between Chinese officials and leaders from participating countries although CEECs basically discard such an '*African'* approach (Godement & Vasselier, 2017, p. 66, p. 73; Buckley & Liu, 2009). This reflects huge differences among CEECs in many dimensions. Among them there are the EU members and those aspiring to be ones. Next, there are huge differences in their development level and structures of the economies. Lastly, all the countries have also their own individual agendas for such a cooperation. Although the '16+1' looks like a multilateral scheme it is basically primarily a framework facilitating bilateral cooperation.

Such an approach resulted in a modest cumulative change in 2012-2017 period and very diverse and unbalanced bilateral economic relations of individual CEE economies with China. Trade in goods between China and all CEECs reached EUR 57.3 billion in 2017, while the total EU-China trade was EUR573 billion. Between 2012 and 2017, China-CEECs trade

[4] Past annual summits were held in Warsaw (2012), Bucharest (2013), Belgrade (2014), Suzhou (2015), Riga (2016), Budapest (2017) and Sofia (2018), (which took place only eight months after the 2017 Budapest summit, shortly before the 20th EU-China summit in July 2018).

in goods increased only by EUR7 billion, at a much slower pace than during the three preceding years[5], when it grew by EUR 20 billion. Trade between China and CEECs faced high growth already before 2012, and since then increased at a much slower pace. Trade flows are unbalanced since Chinese exports to CEECs are expanding much faster than CEEc exports to China. Based on the Eurostat data, all CEECs run a trade deficit with China.

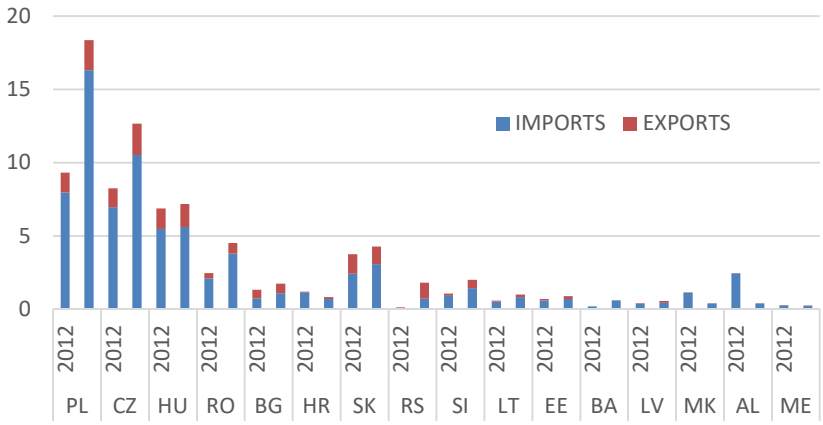


**Figure 1. China- CEECs trade in goods in 2012 and 2017**

Source: Eurostat (2017b) (http://madb.europa.eu/madb/statistical_form.htm). Grieger & Claros (2018).

The second characteristic is a huge variation in bilateral trade relations (Figure 1) and the third is strong concentration on few partners. Trade in goods with larger EU members, such as Poland, Czech Republic (these two have also made the highest growth in the studied period). Their trade rose much faster than trade with the Western Balkan countries, apart from Serbia, which dramatically increased imports from China. It could demonstrate that Serbia as a candidate for the EU membership is regarded by China as a one of the bridges to the EU, reflecting historically and culturally embedded long term China's policy. In general, China's trade with the Western Balkans is still insignificant. Size matters, as lager countries within both groups (Poland, Czech Republic, Hungary, Serbia) trade more than smaller countries (some, like Macedonia, Albania and Montenegro have even faced a decrease in trade). CEECs' trade with China exhibits not only high geographical, but also product concentration, with few changes in product specialisation over time. CEE economies increasingly import higher technology products from China, while exports to China remain largely low-tech. Overall, CEECs have so far failed to export more value-added and high-technology goods to China (Éltető & Szunomár, 2016; Simurina, 2014).

Large variation is also seen in terms of foreign direct investment (FDI) (Figure 2). Though BRI resulted in increased Chinese outward FDI (Du & Zhang, 2018; Kang *et al*. 2018), the 16 CEECs as a whole did not receive a substantial FDI inflow during the 2012-2016 period since the global economic crisis hit them with a delay and more than the rest of Europe. In 2016 CEECs attracted a small share of the global FDI (1.5 per cent), much lower than in 2002-2008 (with shares of 3.8 per cent – 6 per cent of the world total)

[5] It may reflect that CEECs have regarded the expansion of export with China as part of their crises exit strategy.

(UNCTAD, 2018). China reacted as other investors, and contrary to its large inflows into the 'old' EU Member States, Chinese investment in the CEEC-16 was more moderate. Only a small portion of 297 Chinese FDI projects in Europe in 2016, about 25 per cent, landed in CEECs. CEE attracted low share of total FDI stock although globally the attractiveness of the region is improving, and coming third after Western Europe and North America and before China (EY's Attractiveness Survey, 2017). The favourite destinations of FDI in CEE in 2016 were Poland, Czech Republic and Romania, in contrast to Hungary, Slovakia and Lithuania, with negative flows in that period, but large FDI inflows before the economic crisis. Often, particularly in the Western Balkans, investment took the form of loans for infrastructure construction (in transport and energy) rather than FDI.

China was not among top five foreign investors in any of the 16 countries. Figure 2 highlights trends and variation in FDI stocks among CEECs-16 in 2012-2016 period. Chinese FDI is highly concentrated on the biggest CEECs, especially the EU members. The agglomeration effect and the role of previous Chinese investments had already been identified along BRI (Kang *et al*., 2018a). Serbia is the only Western Balkan country that has attracted sizeable FDI from China. Until 2015, Hungary had been the leading FDI recipient, ahead of Poland and Romania, also due to its close political ties with China and its large Chinese diaspora. In the Czech Republic, FDI stock surged in 2015 and 2016, after a diplomatic U-turn since the elections in 2013, when the country shifted from being China's biggest critic among CEECs to one of its most vocal proponents. A comparatively high level of Chinese FDI stock in Latvia is likely to be linked to the country's golden visa schemes and to real estate investment by Chinese citizens.

Some smaller CEECs have started to attract Chinese FDI as well, although at comparatively low levels. Some of China's infrastructure construction projects (although mainly financed by loans) in the CEECs are lagging behind plans. CEECs, as the EU members, have to follow the EU norms and regulations. The EU candidates also have to take them into consideration not to become a barrier to their EU membership.

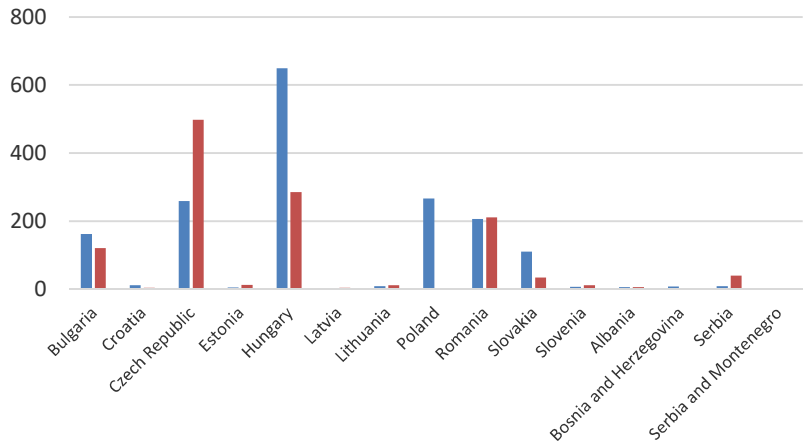


**Figure 2. China's FDI stock in the CEECs, 2013-2016**
Source: Eurostat (2017b). (no data are available for Bosnia and Herzegovina; only 2013 data exist for Montenegro), Grieger & Claros (2018) UNCTAD.

China's investments are primarily guided by its interest within BRI in the region to better connect to the EU market through new intermodal transport channels as time and cost saving alternatives to existing longer ones. Chinese firms were found to invest more along the 'Belt and Road' route after the BRI was launched (Kang *et al*., 2018a); especially large state-owned listed firms (Liu, 2018). Hence, transport and energy investment and infrastructure construction have been China's priorities for the CEECs. This matches the CEEC' interest in improving transport and energy infrastructure. The 2017 IMF report (Atoyan *et al*., 2018) on the infrastructure gap in the Western Balkans states that with the present annual public investment rates it would take the region about 33 years to catch up with the EU level of capital stock per capita. As for the entry mode of FDI, since 2011 Chinese greenfield investment has decreased in favour of acquisitions and has been more common in the EU-11 than in the Western Balkan countries. However, as wages have risen significantly in China but have remained comparatively low in the CEECs, this has created incentives for China to relocate production to the EU's periphery, which may serve increasingly as an assembly base of products for the EU markets (tariff-jumping FDI). In the manufacturing and services sectors, China's market-seeking and efficiency-seeking motives have led to both greenfield investment and acquisitions.

The diversity of bilateral ties of 16 CEECs with China has been classified by Oehler-Şincai (2017, p. 13) The matrix has four different groups with regards to the position of the country in the EU and its attitude to cooperation intensity in the '16+1' format:

1. Active participants ('champions', 'leaders') include the Czech Republic, Hungary, Poland, and Serbia. All are Euro-sceptic and all are China's strategic partners.
2. Ambitious partners include Bulgaria, Latvia, FYR Macedonia, Romania and Slovenia. Most of them are Euro-optimists or Euro-moderates (apart from Bulgaria, which is Euro-sceptic).
3. Followers include Croatia, Estonia, Lithuania and Slovakia. These countries are known as Euro-optimists or Euro-moderates.
4. Laggards involve Albania, Bosnia-Herzegovina and Montenegro, known as Euro-optimists/Euro-moderates.

Oehler-Şincai (2017, pp. 13-15) further concludes that a higher degree of dependency on the EU market and capital does not ensure a positive attitude towards the EU. The highest growth in trade was namely reached with Euro-sceptic countries (Visegrád group, Bulgaria and Serbia), while the Euro-optimists and Euro-moderates represent less than a half of the CEECs in the 16. Even more recent Chinese initiatives, meant to consolidate the economic ties with CEE-16 through direct lending (especially for infrastructure), trade and investment have not ensured automatically a positive attitude towards China, though, however, these countries are ready to intensify their cooperation with China, as a complementary factor for their economic growth.

CEECs' relations with China are not formally coordinated (and do not seem to be informally coordinated either); though the initiative has offered the opportunity to create a new CEEC *'growth pole club'* (Ping & Zuokui, 2017, p. 11), they only modestly upgraded 'previously weak partnerships' and rather reacted as competitors. China is an increasingly influential actor and is active in shaping the foreign relations of other countries (Shen & Watters, 2016; Zhang & Hao, 2018). A platform of 16 CEE countries

is therefore too weak to advance these countries' interests vis-à-vis China and a more powerful EU platform may be complementary. However, the platform generates a networking pushing effect, which stimulates the CEE participants to keep the pace with the active players in order not to be left behind. Their efforts to institutionalise economic cooperation (through a variety of Councils, Contact Mechanisms and Secretariats across different sectors and associations) thus also vary greatly (Table 1). Poland is the most active member among the CEECs, and eight other countries have one institutionalised area of cooperation, often in line with their recognised priority by each participant, which provides more efficiency in organising the '16+1' activities.

As a big country the Chinese think big, they prefer to deal with large countries or groupings to small ones. They regard CEEC partners in the '16+1' on the one hand as a homogeneous group (which is not the case), and on the other hand they differentiate their approach to different countries (or groups within). Instabilities in the EU can potentially provoke competition among the '16' for China's attention, however, it is in China's interest to maintain the region's stability in order to achieve its own economic interests. Beijing quickly realised that successful implementation of projects under the '16+1' framework would require endorsement from the EU and compliance with the EU regulations. For that reason, the 2014 Belgrade Guidelines pledged that all 11 EU members would act 'in accordance with EU legislation, regulations and policies', whereas the EU-China Connectivity Platform initiated in September 2015 and the Riga Declaration issued at the last 16+1 summit in November 2016 recognize the need towards finding synergy between CEE-China and EU-China relations (Istenič, 2017, p. 13).

China is becoming more important and a strategic partner for CEECs and strong bilateral cooperation with China is a part of efforts to diversify their international economic cooperation parallel with the growing role of China in the global economy. In the majority of CEEC-16, however, the EU integration process remains the central element of the economic policies. In spite of the EU weaknesses, most of the CEECs remain strongly dependent on the EU markets and capital. This supports the findings of Nölke and Vliegenthart (2009), who labelled the countries in this region as Dependent Market Economies. However, this does not prevent 11 EU member countries, especially Visegrád Group (V4), but also the candidates such as Serbia, to find a balance between the EU decisions and their own national interest. In their view, the '16+1' and intensified bilateral economic relations with China reduce the dependency on the EU and support the process of catching up in their economic development with 'old' EU Member States.[6] In spite of new complexity within the region and in the EU-China relations (Yu, 2018), CEECs perceive the 16+1' as an opportunity for more economic cooperation and deeper regional integration. Similarly, as BRI programmes and projects that have emerged as an internal and external policy framework for an openly inclusive 'win-win' cooperation model based on shared development and on communities of shared interests (Kang *et al*., 2017b).

[6] The EU engages in the 16+1 as a summit observer, adheres to the principles of its 2016 strategy for China and works towards cooperation with China on physical and digital infrastructure - through the EU-China Connectivity Platform. It has added the Berlin Process to its Western Balkans policy and has issued a new strategy providing for a credible enlargement perspective for and an enhanced EU engagement with the Western Balkans.

**Table 1. Institutions established within the 16+1 initiative**

| Established institutions | Year | Country |
|---|---|---|
| Business Council | 2014 | Poland |
| Secretariat for Investment Promotion | 2014 | Poland |
| New Silk Road Institute (NSRIP) | 2015 | Czech Republic |
| Center for Dialogue and Cooperation on Energy Projects | 2016 | Romania |
| Regional Center of the China National Tourism Administration | 2016 | Hungary |
| Coordination Mechanism on Forestry Cooperation | 2016 | Slovenia |
| Association for the Promotion of Agricultural Cooperation | 2017 | Bulgaria |
| China-CEE Institute | 2017 | Hungary |
| CEE Federation of Chinese Medicine Societies | 2017 | Hungary |
| Virtual '16 + 1 Cooperation' Technology Transfer Centre | 2017 | Slovakia |
| Secretariat on Logistics Cooperation and Virtual Information Platform | 2017 | Latvia |
| Secretariat for Maritime Issues | 2017 | Poland |
| Association on Transport and Infrastructure Cooperation | TBA | Serbia |
| Cultural Cooperation Coordination Center | TBA | Macedonia |
| Inter-Bank Association | TBA | Hungary |
| Small and Medium-sized Enterprises (SMEs) Association | TBA | Croatia |
| Veterinary Science Cooperation Center | TBA | BiH |
| Environmental Protection Association | TBA | Montenegro |

Source: own study.

## Case Study: China-Slovenia Economic Relations

The case of China-Slovenia relations offers an opportunity to understand how the '16+1' challenged developments in trade and investments for a small economy, which is strongly embedded in the EU economy and started at the periphery of this regional platform but has historical ties with China and highlights ambitions for intensified cooperation.

Cooperation between China and Slovenia can be traced back to as early as the 18th century, mostly with knowledge exchange and science. Increased attention and the sympathy to China was next traced with Boxer rebellion (1900), as independence and nation building was of high importance for both nations. More intensive economic relations started to develop during the socialist period. As a part of Yugoslavia, Slovenia started cooperation with China soon after Yugoslavia recognized China in 1949[7]. The relations intensified by the end of 1970s, with the Chinese Open Door Policy and economic reforms that opened gates for the cooperation of Yugoslav republics with Chinese provinces.[8] President Hua Guofeng's visit in 1978 was a further incentive to establish a consortium of Slovene companies for cooperation with China. In 1980s Slovenia became the strongest economic partner of China from Yugoslavia (approx. 60 per cent of all Yugoslav industrial projects in China), though cooperation intensity was decreasing with rising economic crises in China and instabilities within CEECs and former Yugoslavia by the end of the 80s. These relations supported revival and institutionalisation of bilateral ties started in the nineties; China recognised Slovenia as independent state in 1992, though it was against

[7] China, did not recognize Yugoslavia until 1955 when diplomatic relations were established.

[8] Ljubljanska banka opened a representative office in Singapore covering also China and Hong Kong in 1970s.

the disintegration of Yugoslavia. Efforts for cultural and academic cooperation overweighed those for economic relations during the nineties, the first economic strategy towards China was developed only in 1999 by the Ministry for Economic Cooperation and Development (MEOR) and the Slovene Chamber of Economy. The EU integration was central orientation in foreign trade strategy of Slovenia. Only 2015-2020 *Program* for *Internationalization*[9] gave special attention to diversification of economic ties, to increasing export to non-EU members and China is of course included. The last strategic document, adopted by the government of Slovenia, was Development Strategy of Slovenia 2030. China is mentioned in the global context chapter only implicitly by a statements that 'economic power is moving towards Asia, which influences the global changing power relations'.[10] Contrary to modest state-level/governmental relations[11], the interest of entrepreneurs and business sector is growing constantly.

The knowledge about China is limited, however the awareness and the capacity to do business with China is continuously increasing in the last two decades, which is also reflected in bilateral trade data (Table 2, Figure 3). The volume of bilateral trade is growing, however the share of China in total foreign trade remains small and trade deficit for Slovenia is growing.

**Table 2. The share of export and import from China in total Slovenian export and import (in per cent)**

| Category | 1994 | 2000 | 2008 | 2012 | 2017 |
|---|---|---|---|---|---|
| Export | 0.6 | 0.16 | 0.39 | 0.65 | 1.12 |
| Import | 0.5 | 0.39 | 1.91 | 2.79 | 3.14 |

Source: Bank of Slovenia.

Foreign trade with China increased 15 times from 2000 to 2017: export from 2.2 million EUR to 32.5 million EUR, while import from 53 million EUR to 801 million EUR. Since 2004 (with more reliable data due to harmonisation with Eurostat monitoring) the export to China increased by almost 9 times and the import by 4.4 times. Trade deficit increased from 27 million EUR in 1994 to 502 million EUR in 2017. From 2012 to 2017, since the '16+1' was established, Slovenian exports to China rose 1.9 times and imports increased 1.2 times. The Slovenian trade surplus with China thus remained almost the same. The '16+1' framework has not influenced trade flows in a big way. Export was basically stagnating until 2015 when it started to increase substantially, more than the overall Slovene export. The scheme can have a moderate influence on promoting export to China. The import initially dropped and then rose more than export after 2013. The '16+1' has also not influenced the structure of trade in a substantial way. Manufacturers dominate in export and import (over 90 per cent). Value added has slightly increased as the share of chemicals has risen, again on both sides[12].

[9] Programme for internationalisation 2015-2020, (2015).

[10] China showed interest in boosting cooperation with Slovenia in sports and sports infrastructure particularly in the context of the preparations for the 2022 Beijing Winter Olympics. Next, two memoranda of cooperation in infrastructure and sports were signed in 2018.

[11] The absence of bilateral top-level diplomatic meetings in 2012-2018 confirms this statement. Slovenian Prime Minister met Chinese Prime Minister only within the '16+1' initiative.

[12] Initially, textile represented rather high share in Slovene imports from China. Its share in 2000-2017 decreased almost 4 times. Just the opposite trend was in export, where machinery and equipment (capital goods) share

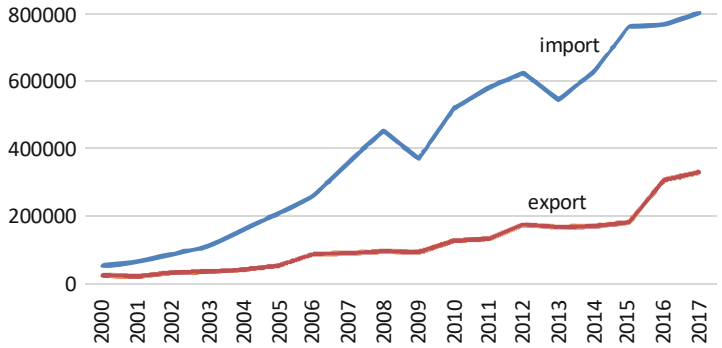


**Figure 3. Dynamics of Slovenian trade with China 2000-2017 (value in millions EUR)**
Source: Data from the Statistical Office of Slovenia (SURS).

A survey among Slovenian enterprises on Chinese-Slovenian business relations (Ivančič, 2009) demonstrated that a small minority of Slovenian enterprises reacted to the growing Chinese market in the nineties. Although they recognised great business opportunities, China was treated as an 'extremely difficult' market and most of firms suffer the lack of information and institutional support. Consequently, they enter the Chinese market slowly and sequentially. Cooperation was mostly limited to those (large and publicly governed/owned) enterprises with experience and knowledge (and relational capital) from the socialist period. Slovenian enterprises started to intensity business ties with China after its entry to the World Trade Organisation, especially since 2002, (often also as a reaction to their German business partners' intensification of their economic ties with China at that time; induced cooperation of suppliers to German firms). Since then also some smaller and medium-sized private firms excluding manufacturing have established business cooperation. However, according to a survey, most of them became involved in imports from China (47.9 per cent), and for most of them this was the only business activity with China. Exports and outward foreign direct investments to China were reported less frequently (10 per cent of the surveyed firms export to China, about 5 per cent of reported joint ventures in China and 6 per cent of wholly owned subsidiaries in China, and few (4 per cent) of them combined more than two entry modes (see more in Ivančič, 2009). Unbalanced structure in trade and investment has not changed; according to the latest available data (2011) there are about 8,000 Slovene firms importing from China and 270 exporting there.

With regard to FDI, Slovenia is a net investor in China (Figure 3). Chinese FDI in Slovenia, although growing, is also very modest (so small that the Bank of Slovenia report on it among 4 most important Asian investing countries). In 2016 the Chinese FDI stock in Slovenia amounted to 11.22 million EUR. Among CEECs only Estonia, Macedonia, Latvia and Montenegro host less Chinese FDI. While some investment proposals given before the '16+1' agreement (for infrastructural projects such as railway network) did not develop into projects, two larger investments came in Slovenia only recently, in 2017; the Chinese

increased more than 4 times. Consumer goods initially formed a high share in Slovene import from China, but it almost halved in 21 years, partly as a reflection of higher standard of living in Slovenia and enhanced awareness of the importance of health and environmental standards, where Chinese firms are still not following all the European standards.

acquired TAM Durabus and the Hisense acquired Gorenje, the largest household appliances producer. The largest Chinese FDI in Slovenia was the purchase of Outfit 7 bought from Slovene owners for 1 bn dollars by Zhejiang Jinke Peroxide[13], after the acquisition with a new name of Zhejiang Jinke Culture Industry. Chinese investors see Slovenia as attractive due to its strategic location and well-educated workforce. Their investments in Slovenia serve them to acquire new modern technology and knowledge. Recent targets demonstrate that China is well on the way toward more innovative economy (Wei *et al*., 2017). The experiences of investors on both sides clearly show that the preferred way is a two-way (investment) cooperation; Chinese firms in Slovenia and Slovene firms with the same partners in China. Cases of such cooperation are Pipistrel[14], Arctur[15] and Elaphe.[16] Next, concentrating cooperation in specific niches, particularly hi-tech, is the best strategy for smaller Slovene firms (not able to compete on economies of scale or scope).

Direct investments to China are also low, but are rising steadily. The share of outward FDI in China in total Slovene investments abroad increased from 0.3 per cent in 2012 to 0.8 per cent in 2016. In terms of value, they gradually increased (although oscillating annually)[17] from extremely modest 0.1 million EUR in 2002 to 7.7 million EUR in 2006 and finally to 44 million EUR plus 4.4 million EUR in Honk Kong in 2016 (Bank of Slovenia, 2017). This is far from what other EU countries are doing in China being, after USA, the number two location for FDI in the world and considered as the most promising FDI home economy for 2017-2019 (UNCTAD; 2017; 9)[18]. Main activities of Slovenian companies in the Chinese market are: production of footwear, products and semi-products for thermoplastics electronics and electromechanical industry, products and components for the automotive industry, sales promotion and market operations, support for the purchasing activities of the parent company. Only recently more technology intensive investments started (Krka; pharmaceutics). More than thirty Slovenian companies have representative offices and companies in the field of automotive, electro, chemical, footwear, textile, trade and transport, operating in China. Among them there are Le-technika, Gorenje, Domel, Etol, Cablex, Letrika, Kolektor, Krka, Cosylab Alpina, Unior, EURO PLUS engineering, Cablex and Gostol.

Enterprises still lack knowledge and skills to overcome all the risks involved in international operations successfully. They are increasingly aware of different mind-sets and have started to articulate needs for learning and understanding the background of Chinese tradition. Different philosophical frameworks between China and the West are reflected in diverging concepts of managing relations with the outside world (Lajčiak, 2017). The importance of understanding an institutional change and ongoing transition in China becomes not only a key challenge to theory makers and business strategists (Child & Tse, 2001, p. 5), but also to enterprises. Slovenian enterprises, although used for transition, (still) have to learn a lot on doing business with China (Polajžer & Turk, 2013; Ivančič, 2009).

[13] A Chinese firm located in Cyprus. As the ultimate owner was outside Slovenia, transaction is not seen in bilateral FDI statistics.

[14] A producer of super light aircrafts.

[15] This high technology firm active in high-performance computing, can also promote Hi-Tech export goods from China to Europe having exclusive rights to export to Europe.

[16] It Is a leading firms producing in-wheel electric motors which are considered as the future in electric cars.

[17] In 2013 and 2014, however, some Slovenian firms even relocated production facilities back to Slovenia; (Finance, September, 2015).

[18] UNCTAD (2017): World Investment Report 2017, UN, New York and Geneve, 9.

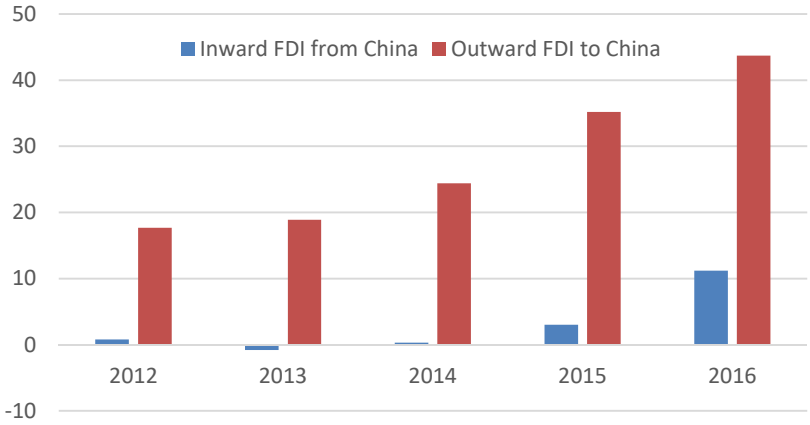


**Figure 4. Chinese FDI in Slovenia and Slovenian FDI in China (stocks, in millions EUR)**
Source: Bank of Slovenia, 2017.

The establishment of the '16+1' has not dramatically changed China-Slovenia economic relations which remained largely unbalanced, however, it has intensified economic cooperation and ambitions. The '16+1' scheme has obviously not influenced much either the flows or the structure of trade which oscillate more as a result of some major firms' activities there[19]. However, the initiative strengthens the awareness of business opportunities within China-Slovenia relations and stimulate firms' more proactive approach.

The analysis highlights that economic relations between China and Slovenia require both intensive political relations and a high level of business-government cooperation in order to attract more Chinese investments and seize the opportunity to enhance export to China as a regional diversification and resilience strategy. An entrepreneurial initiative alone is not sufficient. Often, Slovene companies do not pay enough attention to macro political/economic plans China is making for the future development, such as China's national economic development plan for 2016-2020. It unveils the development concept of 'Innovation, Coordination, Green Development, Opening Up and Sharing', as well as the action plan 'Made in China 2025' and 'Internet+', which show that the Internet, ocean and green economy are becoming key development points (Fister, 2016). In short, Slovenian firms still lack a long-term visionary approach needed to prelist where the future consumption will come from.

## CONCLUSIONS

Integration agreements are typically a long term project and thus rarely become fully effective in the first five years (Baier & Bergstrand, 2007). But in spite of (relatively) small changes in trade and investment the '16+1' influenced not only the CEE trade and investment but

[19] The export will substantially increase after the 2018 Pipistrel's 350 million EUR deal involving export of small planes, airport construction, aircraft production, airport management, aviation training and construction of business and housing work.

also the globalisation patterns in the EU trade and investment. The initiative started as a sort of 'South-South' multilateral scheme reflecting very diverse bilateral trade and investment ties between China and individual CEECs. Not only has it modestly intensified the '16+1' cooperation but also stimulated more fundamental rethinking of the EU-China cooperation and internal competition and cooperation among CEECs. For the majority of CEECs-16 the EU integration process remains the central strategy while the '6+1' a regional diversification and resilience enhancing complementary internationalisation strategy as part of their catching-up process and global integration. The boosting effect of the '16+1' on institutional cooperation is noticed, as it was with OBOR (Kang *et al*., 2018; Du & Zhang, 2018).

Trade and investment in the first five years of the existence of the '16+1' framework have not (yet) changed substantially either in terms of volume or in structure, but remained relatively modest and largely country diverse. The concentration of FDI and trade flows is related to CEE countries' size, the EU membership or candidacy of it, but also political relations and consensus between Chinas' strategic interests regarding big infrastructural projects as a part of BRI and CEEC national or regional (EU) infrastructure strategy. The latter seems to be even more important determinant in the future.

The case of China-Slovenia economic relations revel the perspective of small CEE economy, which is strongly embedded in the EU economy and Western Balkan countries, and where the business sector tries to move from the periphery of the '16+1' initiative. It shares most of the strategic objectives all CEECs have, i.e. to diversify economic cooperation and try to take advantages of the large and growing China market also by upgrading economic cooperation more and more in favour of long term/investment projects.

The question whether the '16 +1' has stimulated the development in CEECs and enabled them a wider access to larger and more diverse markets; higher living standards; lower prices and a greater choice for consumers or a widespread adoption of new technologies is yet to be explored in the coming years. Satisfaction with the rise of acquisitions and investment in infrastructure project in CEECs and hopes to stimulate development by diversifying their trade and investment pattern go in line with concerns for a more balanced trade, reciprocity of market access and more open tenders in the infrastructure construction. Multilateralising the '16+1' remains an opportunity for CEE and the EU.

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## Authors

The contribution share of authors is equal and amounted to 50% each of them.

**Andreja Jaklič**

Professor of International Economics and international Business, University of Ljubljana, Faculty of Social Sciences, Centre of International Relations, coordinator for European studies programme. Involved in several international research projects (ACE Phare, Horizon 2020, GDN) and consultancy (UNCTAD, European Commission, OECD). Visiting professor and researcher at Wirtschaftsuniversität Wien, Helsinki Centre for Markets in Transition, Corvinus University, Trento University and Hubei University in Wuhan (China). Her publications include monographs, *Enhanced Transition through Outward Internationalization* (Ashgate Publishing, 2003), several book chapters and over 40 articles, also in *Journal of World Business*, *Transnational Corporations*, *The Services Industries Journal*, *Eastern European Economies and Post-Communist Economies.* An executive member of AIB-CEE board, served as a board member of EIBA (2010-2016).

**Correspondence to:** prof. dr. Andreja Jaklič, University of Ljubljana, Faculty of Social Sciences, Kardeljeva pl. 5, 1000 Ljubljana, Slovenia, e-mail: andreja.jaklic@fdv.uni-lj.si

**ORCID** http://orcid.org/0000-0001-5118-9112

**Marjan Svetličič**

Professor Emeritus. University of Ljubljana, Faculty of Social Sciences and research fellow at the Centre of International Relations. Dean of the Faculty of Social Sciences (Ljubljana; 1997-2000); Visiting Fellow at the University of Reading, Reading, UK, (1994); President of EIBA 2004, Vice president of EIBA 2005-2007; member of the Steering Committee of the Standing Group of the European Consortium for Political Research (ECPR;2006-2008), Director of the Research Center for Developing Countries (since 1998 Centre of International Cooperation and Development, Ljubljana; 1987-1990), Consultancy work for international organizations like UNCTAD, World bank-IFC, UNIDO, UNESCO, OECD Development Centre, IFC, UNDP, UN University Institute WIDER, OSCE and EU Commission like Evaluator of Phare ACE programmes (1997-99) and Asia Europe Foundation.

**Correspondence to:** prof. dr. Marjan Svetličič, University of Ljubljana, Faculty of Social Sciences, Kardeljeva pl. 5, 1000 Ljubljana, Slovenia, e-mail: marjan.svetlicic@fdv.uni-lj.si

**ORCID** http://orcid.org/0000-0002-5821-6707

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# Knowledge-Intensive Services Development in the EU: Forecasts for Selected Countries and Implications for Poland

**Bianka Godlewska-Dzioboń, Piotr Klimczyk, Agnieszka Witoń**

**ABSTRACT**

**Objective:** The first purpose of the article and the underlying research is to identify trends in the development of the knowledge-intensive services (KIS) sector in selected EU countries and to create forecasts of its further growth. The second purpose is to recognize factors that may help or inhibit Poland from drawing upon the experiences of the analysed countries.

**Research Design & Methods:** We use time-series trend forecasting. Forecasts of the development of the KIS sector in the EU are constructed basing on available time series (2008 - 2017) using the least square method (LSM).

**Findings:** Knowledge-intensive services are developing with various speed in the EU countries, but an existence of a 'glass ceiling' in the context of a possible level of development can be noted. This 'glass ceiling' is situated on different levels for different groups of countries (higher for the most innovative ones, lower for others). While Poland is on the path of convergence with highly-developed EU countries in respect to the growth of knowledge-intensive services sector, several country-specific factors hinder its ability to enter the path of convergence with the innovation-leaders, thus most probably preventing it from ever reaching the highest 'glass ceiling.'

**Implications & Recommendations:** The innovation policy should not only be oriented to support R&D activities but also support the development of KIS.

**Contribution & Value Added:** The added value of the article lies in filling the gap in the literature concerning the analysed issue. The findings may serve as suggestions for creating innovation policy.

| | |
|---|---|
| **Article type:** | research article |
| **Keywords:** | convergence; innovative services; knowledge-intensive services; European Union; Polish economy |
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## INTRODUCTION

Modern economies are based on knowledge and information. Knowledge and information are recognized as the driver of productivity and economic growth. The term 'knowledge-based economy' stems from this fuller recognition of the place of knowledge and information in modern economies.

One of the elements of knowledge-based economy is a dynamic development of knowledge-intensive services (KIS) (Wyszkowska-Kuna, 2016). The areas of KIS are characterised by large involvement in research and development[1] (Doloreux, Shearmur, & Rodriguez, 2015) and employment of highly educated workforce. The knowledge resource held by the service provider and innovation are necessary conditions for the activity to be included in KIS category. These services may be provided as part of business activity or obtained from specialised third-party companies. KIS is, therefore, capital and knowledge-intensive. These services are a vital source of innovation for businesses and entire economy. Knowledge-intensive services contribute not only through the diffusion of knowledge and innovation to the creation and transfer of modern technology but also to an increase in productivity (Musolesi, & Huiban, 2009, p. 63) and thus to acceleration of economic growth (Klaesson, & Norman, 2015, p. 158).

An increase in the number and influence of knowledge-intensive business services (KIBS) in the EU can be attributed to several factors. First, there is an increasing need for knowledge within the economy. Increasing research and development is seen as a significant venue towards the attainment of this objective. Second, the strategies put in place by most governments in the region offer a conducive environment for the increase in KIBS (Pauceanu, 2015, p. 12). In Poland and other CEE countries, a rapid growth of KIS can be seen after 1989 (Baláž, 2004, p. 1).

The purpose of the article is to show trends in the development of the knowledge-intensive services (KIS) sector in selected EU countries and to create projections of its further growth. The second purpose is to identify factors that may help or inhibit Poland from drawing upon the experiences of the analysed countries. To fulfill those aims, we verify the main hypothesis, which is as follows: the process of development of knowledge-intensive services has a certain limit that cannot be overcome, which can be called a 'glass ceiling'. Furthermore, three additional hypotheses were developed: (1) The level of the proposed 'glass ceiling' of knowledge-intensive services development varies in particular economies; (2) The knowledge-intensive services sector is characterised by decreasing marginal productivity; (3) Knowledge-intensive services sector in Poland is on the path of convergence with highly-developed EU countries.

To verify these hypotheses we use time series trend forecasting of the development of the KIS sector in the EU countries.

[1] A study carried out by Masso and Vather (2012) concludes that, although knowledge-intensive services (KIS) spend more on research and development (R&D) the efficiency of turning R&D expenditures into innovation is higher in less knowledge-intensive sectors.

## LITERATURE REVIEW

In the literature of the subject, two concepts are often used interchangeably: knowledge-intensive services (KIS) and knowledge-intensive business services (KIBS). The difference between them is that knowledge-intensive business services (KIBS) are the sub-group of KIS. In the literature, KIBS are defined as firms that provide knowledge-intensive goods and services for other business firms (Schricke, Zenker, & Stahlecker 2012, p. 6). Thus, KIBS include all KIS, except for education, health and social work, recreational, cultural, and sporting activities, which are services destined for consumers (Wyszkowska-Kuna, 2016).

The origins of the research on KIS dates back to the 1990s of the last century (Miles *et al*., 1995). According to this author, 'Knowledge-Intensive Business Services involve economic activities which are intended to result in the creation, accumulation, or dissemination of knowledge' (Miles *et al*., 1995, p. 18). They act as transmitters of knowledge, contributing in different ways to the innovation processes of related firms (Miles *et al*., 1995, pp. 41-42). Currently, applicable definitions of KIS and KIBS have some common features, focusing on the high involvement of excellent work (requiring a high level of knowledge), a diffusion process and a significant impact on innovative activities within the enterprise and the economy (Gallego & Maroto, 2015; Dubosson & Fragniere, 2008). Concluding, knowledge-intensive business services (KIBS) are:

- performed by private companies and organisations,
- relying on professional knowledge, related to a specific (technical) discipline or (technical) functional domain,
- supplying intermediate products and services that are knowledge-based (Bilderbeek *et al*., 1998).

KIS are key players in innovation systems, particularly in advanced regions where manufacturing competitiveness depends on knowledge contents provided by highly specialised suppliers (Braga, Marques, & Serrasqueiro, 2018 p. 360).

Among the determinants of the development of the KIS sector one can mention (Miles *et al*., 2018):

- growing demand from organisations that focus on 'core competences', outsourcing non-core activities to specialised suppliers,
- increasing requirements for external knowledge,
- changing environments and technologies which require knowledge to fully utilise them,
- growing complexity of economies and the technologies which are deployed in them.

Nowadays, many authors develop the concept of knowledge-intensive services. Full review of authors, publications, topics, and the number of citations is included in a study by Figueiredo *et al*. (2017). The three most-quoted authors are: Miles, Hertog and Muller, and the four most frequently quoted articles are by Muller and Zenker (2001), Hertog (2000), Miles (2005) and Bettencourt *et al*. (2002).

Many studies focus on spatial variation of innovation in the knowledge-intensive business sector. The subject of their analysis is the regional diversification of companies in the KIS sector (Brenner *et al*., 2018; Dolores & Shearmur, 2012; Klaesson & Norman, 2015; Pauceanu, 2015; Ženka *et al*., 2017). The mentioned articles analyse the KIS in some countries (Sweden, Germany, the Czech Republic). Only Alexandrina Pauceanu (2015) presents KIS in all countries

of the EU. As a continuation of our research on the service sector (Godlewska-Dzioboń, Klimczyk, & Witoń, 2018), in this article we follow the above mentioned research and also focus on the KIS topic from the point of view of the service structure. We want to present the current KIS situation and its share in the EU countries, but our added value is forecasting changes of KIS and their implications for the Polish economic policy.

According to Rodriguez (2014), studies of KIS can be classified into three groups depending on their main objective. The first group contains works that link regional innovation efficiency and KIBS (i.e. Brenner *et al*., 2018; Gallego & Maroto, 2015). The second group of authors and we focus on the location of KIS (Pauceanu, 2015; Ženka *et al*., 2017). The third group of publications addresses how regional features affect the formation of KIS (Dolores & Shearmur, 2012).

There seems to be an agreement in literature that knowledge intensive (business) services can contribute to economic growth, either regional or national (Brenner *et al*., 2018; Desmarchelier, Djellal, & Gallouj, 2013). Knowledge intensive business services provide advanced technological knowledge directly to other industrial sectors, and indirectly to the whole economy (Castellacci, 2008; Radovanović, Dmitrović, & Žarkić Joksimović, 2017). The economy can benefit collectively from the knowledge produced by KIBS (Brenner *et al*., 2018). The contribution of KIBS to the productivity of the other industrial sectors may well exceed the productivity gains as measured within the KIBS sector itself (Castaldi, 2009).

However, the relationship between KIS/KIBS and economic growth is two-way. There is a strong demand-pull mechanism in place. Growth in the rest of the economy causes KIBS to grow in the next or later years (Brenner *et al*., 2018). Therefore, the development of the KIS/KIBS sector in the most developed EU economies is limited due to the slowdown in economic growth. Additionally, according to Baumol (2002) and Wolff (2002), intellectual work is stagnant – the rise in costs is nowhere near being balanced by the improvement in the 'act of thinking'. This causes productivity decreases in knowledge-intensive sectors. What is more, some KIS/KIBS firms follow their clients overseas, and/or seek new markets in (especially) emerging economies. A possible trend is likely to be the emergence of KIBS firms within emerging economies – catering to local and/or world markets (Miles, 2018). Having considered this, we proposed the main hypothesis of the study, which posits that the process of development of knowledge-intensive services has a certain limit that cannot be overcome, which can be called a 'glass ceiling'. The exact level of that limit should be analysed in further studies.

## MATERIAL AND METHODS

Sector development of knowledge-intensive services is measured as employment in KIS in relation to all employment in the economy. The data was obtained from the Eurostat's database. The data source is the European Labour Force Survey (LFS). The definition of knowledge-intensive services used by Eurostat is based on a selection of relevant items of NACE Rev. 2 on a 2-digit level and is oriented to the ratio of highly qualified workers in these areas.

In the course of study, the following hypotheses were developed: The main hypothesis: The process of development of knowledge-intensive services has a certain limit that cannot be overcome, which can be called a 'glass ceiling'. Additional hypotheses were developed:

1. The level of the proposed 'glass ceiling' of knowledge-intensive services development varies in particular economies;
2. The knowledge-intensive services sector is characterised by decreasing marginal productivity;
3. The knowledge-intensive services sector in Poland is on the path of convergence with highly-developed EU countries.

The available data include the years 2008-2017 and that period was used to build predictions about the development of the KIS sector in the European Union. The length of the available time-series must be considered a limitation of the study, and it needs to be taken into account when perusing the results. Additionally, this method does not identify factors causing the 'glass ceiling' in KIS. This issue should be addressed in further studies. Forecasts were constructed using the method of least squares. The method of least squares is a standard approach in regression analysis to approximate the solution of overdetermined systems. The principle of least squares regression states that the best choice of this linear relationship is the one that minimises the square in the vertical distance from the y values in the data and the y values on the regression line (Watkins, 2016, p. 37). This leads to a minimisation problem for:

$$SS(\alpha, \beta) = \sum_{i=1}^{n} \epsilon_i^2 = \sum_{i=1}^{n} (y_i - (\alpha + \beta x_i))^2 \quad (1)$$

This approach – with the use of econometric models to forecast socio-economic – is known as a classical statistical approach (Wilks, 2006, p. 217). It is used in cases in which the course of the testing phenomenon is regular over time, and the observed trend is permanent and can be described with a smooth mathematical function. It is assumed that the regularity governing the testing phenomenon will not change significantly during the period for which the forecast is based. The predictions reach the year 2025, but their accuracy decreases as the time horizon progresses.

It was initially assumed that the time series equations would be evaluated in the form of second-degree polynomials:

$$\hat{z}_{it} = \alpha + \beta_1 * t^2 + \beta_2 * t \quad (2)$$

where:

$\hat{z}_{it}$ - ind involvement of employment in the KIS sector in the country $i$ in the year $t$;
$t$ - time variable;
$\alpha$ - constant;
$\beta_1, \beta_2$ - structural parameters.

In some cases, for a better fit of the model, statistically insignificant at least at the level α=0.1 independent variables appearing in the estimation process were abandoned (time variable or its square) and eventually, linear time series were obtained. The estimated equations for all EU countries are included in Table 1.

The degree of the fit of the model was different for different countries. The model's fit is assessed by the coefficient of determination $R^2$. The value of this coefficient shows what part of the variation in the response variable is due to the fit of the model. The rest (1- $R^2$) is due to the residuals. The $R^2$ can be interpreted as the proportion of the variation of the predictand that is described or accounted for by the regression (Wilks, 2006, p. 186). R2 is calculated in the following way (Watkins, 2016, p. 43):

$$R^2 = \frac{\sum_{1=1}^{n}(\hat{y}_i - \bar{y}_i)^2}{\sum_{1=1}^{n}(y_i - \bar{y}_i)^2} \quad (3)$$

where:

$\hat{y}_i$ - are the theoretical values of the dependent variable (calculated with the model);

$y_i$ - are empirical values of the dependent variable.

The coefficient of determination $R^2$ was 0.990 in the case of Sweden, 0.978 in the case of Portugal, 0.964 in the case of Finland, and 0.968 in the case of Bulgaria. On the other hand, in the case of Germany $R^2$ was only 0.342, and in the case of Lithuania – 0.391, which proves a weak model match for these countries. A complete exception was the Netherlands, for which the created model has no prognostic value ($R^2$=0.047).

Calculated residual variability coefficient (indicating how much of the average value of the explanatory variable is the deviation of the residual component) was for below 3% all the countries, which suggests that the development of KIS in the selected countries is very slightly affected by random factors.

The usability of the forecasts constructed by the estimated trends is determined by their accuracy, measured with an ex-ante forecast error. It was calculated as a quotient of the forecasted value and its standard error. The obtained results allow to determine most forecasts as accurate (relative error ex-ante < 5%), however, in some cases it is necessary to reject forecasts for further years. Too high (>5%) relative errors of the forecast were observed: for Bulgaria from the year 2024, Denmark from the year 2022, for Estonia from the year 2019, for Greece from the year 2021, for Spain from the year 2021, for Ireland from the year 2021, for Luxembourg throughout the analysed period, for Poland from the year 2024, for Portugal from the year 2022, for Romania in the year 2025, for Slovenia from the year 2022, for Hungary from the year 2022, and for Italy from the year 2023.

To verify the second hypothesis, in the further part of the study the productivity in the KIS sector was analysed in individual years. In this case, due to the limited availability of the data, the testing period is restricted to 2008-2014. The productivity of the sector was measured as the production value for every euro of personnel costs. In this section, the analysis was carried out only for the knowledge-intensive high-technology services.

The last part of the study draws conclusions for the Polish KIS sector and assesses the opportunities and threats it faces.

## RESULTS AND DISCUSSION

During the analysis period 2008-2017, in almost all the EU countries, the development could be observed in the knowledge-intensive services sector. In the whole EU (28 countries) employment in the KIS sector increased three percentage points in the years, from 37% to 40%. This is slightly less than the average change for all the EU countries (3.36 percentage points). Of course, the situation developed differently for different groups of countries. In the group of Innovation Leaders according to Innovation Scoreboard 2018 (Sweden, Denmark, Finland, the Netherlands, the United Kingdom, and Luxembourg), the average share of employment in the KIS sector has grown by only 0.88 percentage points from 47.37% to 48.25%. In the group of Strong Innovators (Germany, Belgium, Ireland, Austria, France, and Slovenia) the average share of employment in the KIS sector increased

by 3.43 percentage points from 38.9% in 2008 to 42.33% in 2017. The most dynamic development of the KIS sector has been observed in Moderate Innovators (Czech Republic, Portugal, Malta, Spain, Estonia, Cyprus, Italy, Lithuania, Hungary, Greece, Slovakia, Latvia, Poland, and Croatia): by 4.42 percentage points from 31.54% to 35.96%. In turn, in the group of Modest Innovators (Bulgaria, and Romania) the average share of employment in the KIS sector increased by 3.1 percentage points from 23.1% to 26.2%. In the case of Poland, an increase in the share of the KIS sector in total employment amounted to three percentage points from 28.3% in 2008 to 31.3% in 2017. Special cases were Luxembourg and the Netherlands, countries characterised by a high level of development of the KIS sector (the share in employment in 2017 48.5% and 45%, respectively). where, in the analysed period, there was a decrease in the employment share in this sector, 5.7 percentage points and 1.9 percentage points, respectively. In particular, in the case of Luxembourg, this decrease can be explained by a change in factors directly related to the definition of knowledge-intensive services. In the years 2015-2017, when the share of KIS in total employment began to decline in Luxembourg, a decrease in the share of the population with higher education and a simultaneous increase in employment was also seen. Employment in other sectors was characterised by higher dynamics than employment in the KIS.

As mentioned, in almost all the EU countries (and the European Union as a whole) knowledge-intensive services are developing, which is illustrated by the increasing share of this sector in total employment. However, the analysis of the constructed forecasts shows that the achieved increments are getting smaller. The determined trend lines (Table 1) indicate that some of the analysed countries have already reached the maximum level of the share of employment, corresponding to the conditions characterising the country. The other surveyed countries will soon reach this level, after which employment in KIS may start to decline.

**Table 1. Functions of employment trends in KIS in the European Union countries (as % of total employment)**

| Country | Trend function | Coefficient of determination $R^2$ | Residual variability factor (in %) |
|---|---|---|---|
| Belgium | $\hat{z}_{BEt} = 45.12 + 0.343636 * t$ | 0.894673 | 0.805 |
| Bulgaria | $\hat{z}_{BGt} = 25.93 - 0.075 * t^2 + 1.20682 * t$ | 0.967816 | 0.899 |
| Czech Republic | $\hat{z}_{CZt} = 30.2067 + 0.313333 * t$ | 0.801868 | 1.566 |
| Denmark | $\hat{z}_{DKt} = 45.2717 - 0.133712 * t^2 + 1.52114 * t$ | 0.777567 | 1.295 |
| Germany | $\hat{z}_{DEt} = 39.3333 + 0.108485 * t$ | 0.341760 | 1.211 |
| Estonia | $\hat{z}_{EEt} = 31.4583 - 0.082197 * t^2 + 1.21386 * t$ | 0.665089 | 2.599 |
| Ireland | $\hat{z}_{IEt} = 39.2067 - 0.159091 * t^2 + 2.03788 * t$ | 0.887204 | 1.368 |
| Greece | $\hat{z}_{GRt} = 30.63 - 0.0886364 * t^2 + 1.435 * t$ | 0.905916 | 1.613 |
| Spain | $\hat{z}_{ESt} = 29.8667 - 0.131818 * t^2 + 1.86879 * t$ | 0.924267 | 1.500 |
| France | $\hat{z}_{FRt} = 42.6867 + 0.375152 * t$ | 0.945131 | 0.649 |
| Croatia | $\hat{z}_{HRt} = 27.02 + 0.809091 * t$ | 0.935005 | 2.177 |
| Italy | $\hat{z}_{ITt} = 33.54 + 0.118182 * t$ | 0.922556 | 0.322 |
| Cyprus | $\hat{z}_{CYt} = 33.4933 + 0.641212 * t$ | 0.823784 | 2.573 |
| Latvia | $\hat{z}_{LVt} = 33.4267 + 0.37697 * t$ | 0.681614 | 2.331 |
| Lithuania | $\hat{z}_{LTt} = 32.0667 + 0.23697 * t$ | 0.390587 | 2.848 |
| Luxembourg | $\hat{z}_{LUt} = 51.2833 - 0.285606 * t^2 + 2.59682 * t$ | 0.814755 | 2.715 |
| Hungary | $\hat{z}_{HUt} = 32.5667 - 0.0590909 * t^2 + 0.877879 * t$ | 0.821856 | 1.240 |

| Country | Trend function | Coefficient of determination $R^2$ | Residual variability factor (in %) |
|---|---|---|---|
| Malta | $\hat{z}_{MTt} = 38.8 + 0.832727 * t$ | 0.900125 | 2.053 |
| Netherlands | $\hat{z}_{NLt} = 46.2267 - 0.0484848 * t$ | 0.047488 | 1.517 |
| Austria | $\hat{z}_{ATt} = 35.4 + 0.338182 * t$ | 0.824473 | 1.345 |
| Poland | $\hat{z}_{PLt} = 27.6883 - 0.0541667 * t^2 + 0.881288 * t$ | 0.937294 | 0.923 |
| Portugal | $\hat{z}_{PTt} = 26.47 - 0.0643939 * t^2 + 1.6053 * t$ | 0.978161 | 1.425 |
| Romania | $\hat{z}_{ROt} = 19.4683 + 0.0288759 * t^2$ | 0.813273 | 2.437 |
| Slovenia | $\hat{z}_{SIt} = 30.36 - 0.0681818 * t^2 + 1.17727 * t$ | 0.911859 | 1.438 |
| Slovakia | $\hat{z}_{SKt} = 30.0733 + 0.453939 * t$ | 0.854230 | 1.849 |
| Finland | $\hat{z}_{FIt} = 40.765 - 0.0443182 * t^2 + 0.918409 * t$ | 0.963867 | 0.671 |
| Sweden | $\hat{z}_{SEt} = 49.34 + 0.427273 * t$ | 0.990293 | 0.263 |
| United Kingdom | $\hat{z}_{GBt} = 46.3967 - 0.044697 * t^2 + 0.693485 * t$ | 0.693220 | 1.090 |

Source: own calculations based on Eurostat's database, https://ec.europa.eu/eurostat/data/database, Retrieved on September 11, 2018.

Due to the volume restrictions, the article will not present forecasts for all EU countries. It was decided to present only selected countries – Innovation Leaders (Denmark, Finland, Sweden, and the United Kingdom), Modest Innovators (Romania, and Bulgaria), and the neighboring countries of Poland in the Innovation Scoreboard ranking (Croatia, and Latvia).

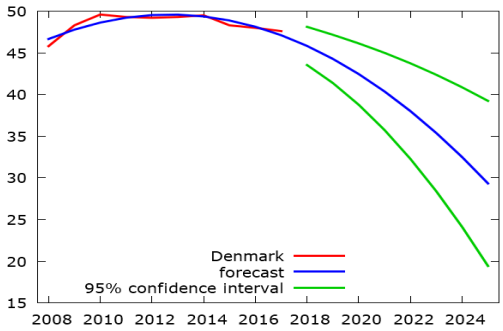


**Figure 1. The participation of the KIS sector in employment in Denmark (data for 2008-2017 and the forecast for 2018-2025)**

Source: own calculations based on Eurostat's database, https://ec.europa.eu/eurostat/data/database, Retrieved on September 11, 2018.

Starting with the best-performing countries in creating and implementing innovation, it can be seen that (excluding Sweden) the forecast foresees that the share of the KIS sector in total employment will decrease. The 'glass ceiling' for Denmark has been the level of 50% share of KIS in total employment, for Finland – 46%, for the United Kingdom – also 50% (Figures 1-4).

In the case of the least-performing group of innovations, the forecast shows that the KIS sector in Bulgaria will hardly exceed the level of 32% share in the employment. In turn, Romania, in spite of the projected continuous development of the KIS sector, will not exceed 30% share in total employment (Figures 5-6).

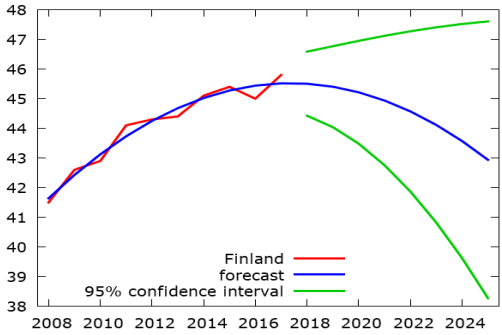


**Figure 2. The participation of the KIS sector in employment in Finland (data for 2008-2017 and the forecast for 2018-2025)**

Source: own calculations based on Eurostat's database, https://ec.europa.eu/eurostat/data/database, Retrieved on September 11, 2018.

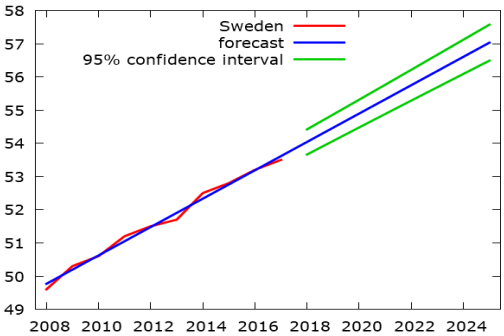


**Figure 3. The participation of the KIS sector in employment in Sweden (data for 2008-2017 and the forecast for 2018-2025)**

Source: own calculations based on Eurostat's database, https://ec.europa.eu/eurostat/data/database, Retrieved on September 11, 2018.

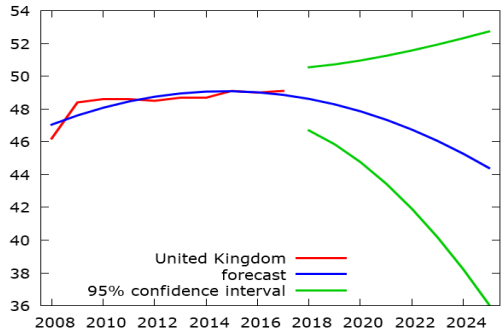


**Figure 4. The participation of the KIS sector in employment in the United Kingdom (data for 2008-2017 and the forecast for 2018-2025)**

Source: own calculations based on Eurostat's database, https://ec.europa.eu/eurostat/data/database, Retrieved on September 11, 2018.

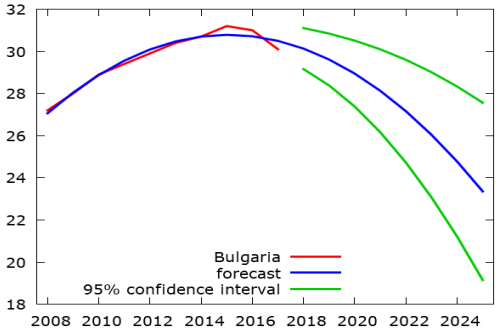


**Figure 5. The participation of the KIS sector in employment in Bulgaria (data for 2008-2017 and the forecast for 2018-2025)**

Source: own calculations based on Eurostat's database, https://ec.europa.eu/eurostat/data/database, Retrieved on September 11, 2018.

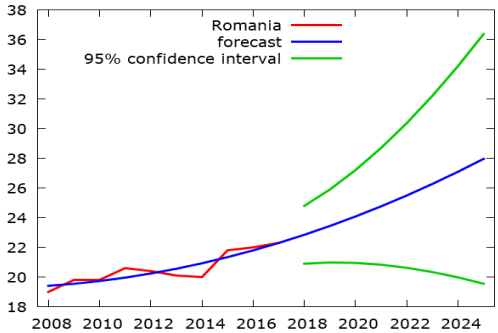


**Figure 6. The participation of the KIS sector in employment in Romania (data for 2008-2017 and the forecast for 2018-2025)**

Source: own calculations based on Eurostat's database, https://ec.europa.eu/eurostat/data/database, Retrieved on September 11, 2018.

Poland and countries similar to Poland in terms of ranking on the Innovation Scoreboard 2018 are characterised by diversified trends in KIS development. Poland most likely (as previously described Bulgaria) will not exceed the level of 32% of the KIS sector in total employment. The observed development of knowledge-intensive services in recent years has slowed down, and, according to the constructed forecast, reached its maximum. In turn, Croatia and Latvia are characterised by a growing trend line of the share of KIS in total employment. In the years 2008-2017 these countries were characterised by a rapid growth of this sector (an increase in the share of KIS in total employment by 7.4 and 5.1 percentage points, respectively), which allows to determine that achieving the 40% share of KIS in total employment by the year 2025 is possible (Figures 7-9).

Extending the reflection on the maximum share of the KIS sector in employment across all the EU countries, using only historical data (not forecasts), we may notice the existence of several 'glass ceilings'. The first group consists of countries where the share of the KIS sector in employment does not exceed 32-33% over the period 2008-2017.

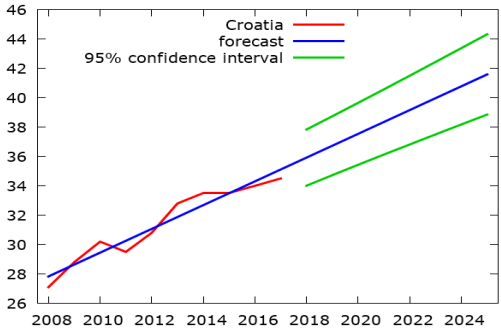


**Figure 7. The participation of the KIS sector in employment in Croatia (data for 2008-2017 and the forecast for 2018-2025)**

Source: own calculations based on Eurostat's database, https://ec.europa.eu/eurostat/data/database, Retrieved on September 11, 2018.

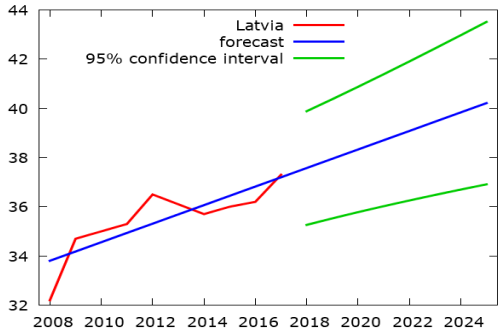


**Figure 8. The participation of the KIS sector in employment in Latvia (data for 2008-2017 and the forecast for 2018-2025)**

Source: own calculations based on Eurostat's database, https://ec.europa.eu/eurostat/data/database, Retrieved on September 11, 2018.

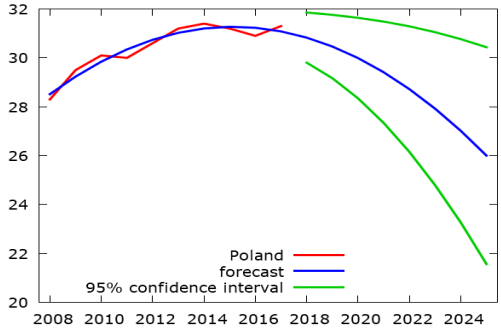


**Figure 9. The participation of the KIS sector in employment in Poland (data for 2008-2017 and the forecast for 2018-2025)**

Source: own calculations based on Eurostat's database, https://ec.europa.eu/eurostat/data/database, Retrieved on September 11, 2018.

These are Bulgaria, the Czech Republic, and Poland, moderate or modest innovators. The second group brings together countries where the share of the KIS sector in employment does not exceed 35-37%: Estonia, Greece, Spain, Croatia, Italy, Latvia, Lithuania, Hungary, Portugal, Slovenia, and Slovakia. Almost all countries in this group (except for Slovenia) are moderate innovators. Another 'glass ceiling' is observed at the level of 40%. This level is approached, but not significantly exceeded, by Germany, Cyprus, Austria, as well as the EU as a whole, and also the Eurozone. The sector's share in employment for the fourth group is 45-47%. This includes Ireland, France, Malta, the Netherlands, and Finland – strong innovators and innovation leaders. The level of 50% share of the KIS sector in total employment is the 'glass ceiling' for Belgium, Denmark, and the United Kingdom, also strong innovators and innovation leaders. This level is exceeded only in Sweden and Luxembourg. In the analysed years, Luxembourg was characterised by an extremely high share of KIS in total employment, reaching up to 58% in the year 2014. In recent years, however, a significant reduction in employment in the KIS sector could be observed (to 48.5% in 2017). It can be predicted that in the future a similar fate will be shared by Sweden, which, for the time being, continuously develops its KIS sector. Given the parabolic shape of many constructed trend lines and the results of the constructed forecasts, it can be said that some of the analysed countries have already reached their maximum level of development of KIS, and some will reach it in the coming years. However, constant progress of knowledge-intensive services should not be expected.

Similar conclusions can be drawn by analysing productivity in knowledge-intensive services. In the years 2008-2014, the vast majority of the EU countries experienced a decrease in productivity defined as production of the sector per one-euro of personnel costs (Figure 10). During that period only in Belgium, Sweden, Finland, and the United Kingdom productivity increased (by 11%, 4%, 3%, 2%, respectively). Such results are not surprising. Tassey (2004) pointed out that knowledge-based services are at risk of a decrease in productivity. This is due to the fact that they typically represent the final stage in a system of products related to consumption (e.g., communication, marketing, or trade).

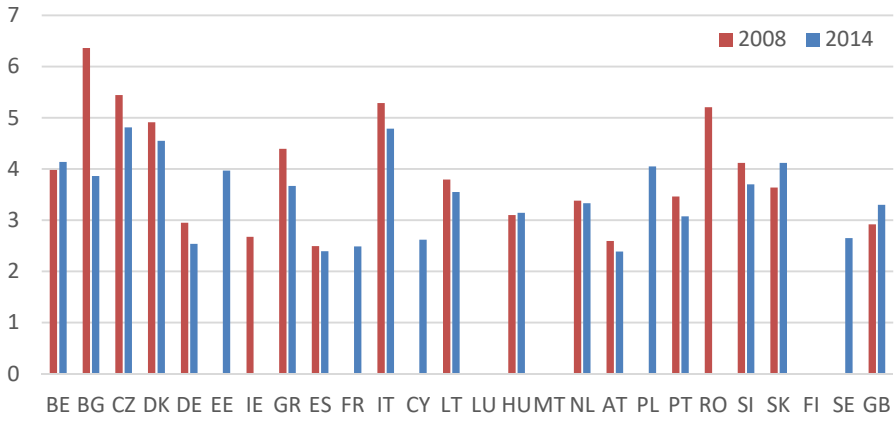


**Figure 10. Productivity in knowledge-intensive high-technology services in the EU countries in 2008-2014**

Source: own calculations based on Eurostat's database, https://ec.europa.eu/eurostat/data/database, Retrieved on September 11, 2018.

What needs to be acknowledged is the fact that not all jobs in the knowledge intensive services sector are innovative, or actually knowledge intensive. To demonstrate this we compared some aspects of working conditions in two sectors: Financial (and other services) and Commerce and Hospitality (Figure 11). It can be observed that, depending on the aspect, only 50-80% of the jobs in Financial Services demand some form of knowledge processing. On the other hand, those figures are significantly lower for Commerce and Hospitality sector, so while it can be said that the KIS sector is not fully knowledge-intensive, it is still much more knowledge-intensive than other services.

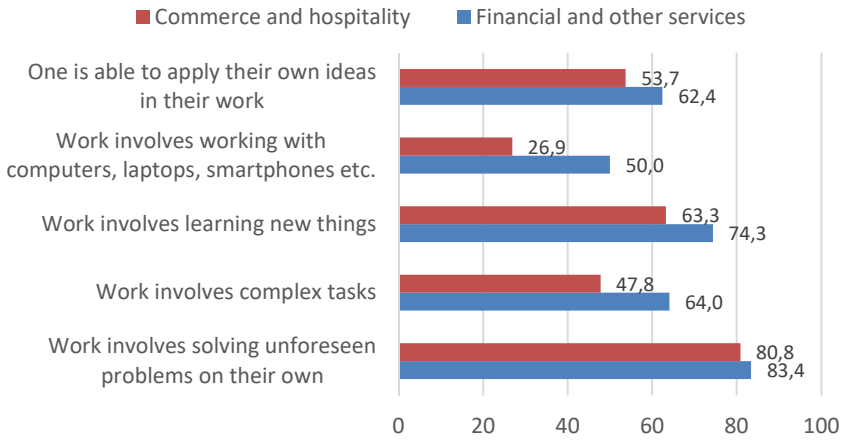


**Figure 11. Percentage of respondents agreeing with knowledge-related statements concerning their workplace in 2015 (average for the EU countries, Albania, the former Yugoslav Republic of Macedonia, Montenegro, Serbia, Turkey, Norway, and Switzerland)**

Source: own calculations based on the European Working Conditions Survey (EWCS), https://www.eurofound.europa.eu/surveys/european-working-conditions-surveys, Retrieved on December 17, 2018.

Focusing on Poland, it should be emphasized once again that although in the years 2008-2017 the share of the KIS sector in total employment increased by three percentage points, the pace of these changes slows down, and currently the forecasts do not give it a chance to catch up to the countries – innovation leaders in this area. The declining efficiency is not conducive to the development of the KIS sector in Poland (-14% in the years 2008-2014), but this trend is observed in most EU countries, and the efficiency in Poland remains higher than the EU average (5.20-euro of production for 1 euro of personnel cost to 3.73 euro in EU).

## CONCLUSIONS

The study examined the design of knowledge-based business services in selected European countries. The EU-15 countries were characterised by a higher level of use of KIS and innovation than the EU-12 countries. In most EU countries, efficiencies in the KIS sector may fall; this is due to decreasing performance in Europe and the growing competition of non-EU outsourcing companies (e.g. in India), where costs are low.

In the case of Poland, the development of KIS also depends on the demand for innovative services, even the 'innovation climate.' In Poland, low spending on research

and development continues, despite the extensive participation of people with higher education in the labour market, resulting in a significant mismatch between the skills of workforce and business needs.

However, weak signals suggesting a break in the trends presented can be seen. In Europe, this signal is the economic growth that eventually appears after the financial and debt crisis. With a demand-side mechanism, economic growth can revive the KIS sector. In particular, in Poland a significant influx of immigrant workers from non-EU countries (mainly Ukraine) can reduce staff costs in the KIS sector. Migrant workers tend to concentrate in larger cities, and many of them are attending local schools for higher education. This skilled workforce finds employment in outsourcing companies located in Poland, as opposed to previous years, when outsourcing companies moved to non-EU countries seeking lower costs.

The test carried out was not free from research limitations. It should be noted that the time series used to construct the projections were limited due to the availability of data concerning the EU's knowledge-intensive sectors; this can affect the accuracy of the results.

It can be concluded that the future standard of living for citizens in the EU will depend heavily on the KIS sector and the services sector. Based on the findings, it can be considered that it is essential that policymakers and governments put more emphasis on the development of the sector, notably by offering financial support, incentives and building a favourable political and economic environment for the functioning of KIS and knowledge transfer process. Besides, the development of a knowledge-based economy should also intensify the development of the information and communication sector (ICT). The results of the study can be a signal for innovation policy that it should not only target R&D activities, but also support the development of KIS and innovation systems. It should also be noted that the current technological advances not only allow but also determine the implementation of activities related to the use of artificial intelligence and robotics in organisations. This will be a competitive advantage by reducing the cost of doing business, while at the same time increasing the efficiency of investment. However, it should be remembered that while the introduction of artificial intelligence undoubtedly contributes to the growth of GDP, it is not possible to downplay ethical issues or the consequences of the social introduction of new technologies.

Concluding, it should be stressed that the providers of business services have a relatively high potential to create innovative solutions in their activities. They are quite well prepared for both the infrastructure and the personnel side. There are no significant financial constraints in this respect, and innovation is regarded as important support for the processes of market competition.

Unexpectedly, however, the market can also hinder innovation development in KIS. Many companies using these services are more valued for their proven, less risk-based solutions. Inherent barriers in customer awareness seem to be the most difficult to overcome, and their recognition requires to conduct research among managers of companies using knowledge-intensive services.

We hope that our article will be an inspiration for further scientific research in the topic of KIS. Due to research limitations we focused only on the main components of the KIS development in the EU countries. The most important questions that should be addressed in the future concern the following issues:

– What creates the glass ceiling in the KIS sector?

– Could the decreases in KIS employment in innovation leader countries be due to automation and AI development?
– What are the possible factors that could help a country to break the forecasted trend?

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## Authors

The contribution share of authors is equal and amounted to 33% each of them.

**Bianka Godlewska-Dzioboń**
Master in Economics (Faculty of Economics, specialisation: Accountancy, Cracow University of Economics); PhD in Economics (Cracow University of Economics). Research interests include international trade, labour market and the structure of economy.
**Correspondence to:** Bianka Godlewska-Dzioboń PhD, Cracow University of Economics, ul. Rakowicka 27, 31-510 Kraków, Poland, e-mail: godlewsb@uek.krakow.pl
**ORCID** http://orcid.org/0000-0001-9668-458X

**Piotr Klimczyk**
Master in Economics (Faculty of Economics, specialisation: Foreign Trade, Cracow University of Economics); PhD in Economics (Cracow University of Economics). Research interests include international trade, labour market and the structure of economy.
**Correspondence to:** Piotr Klimczyk, PhD, Cracow University of Economics, Theory of Economics Department, ul. Rakowicka 27, 31-510 Kraków, Poland, e-mail: klimczyp@uek.krakow.pl
**ORCID** http://orcid.org/0000-0001-9238-2744

**Agnieszka Witoń**
Master in Economics (specialisation: International Economics, Jagiellonian University in Cracow); PhD in Economics (Cracow University of Economics). Research interests include economic growth, socio-economic development, and knowledge-based economy.
**Correspondence to:** Agnieszka Witoń, PhD, Cracow University of Economics, Theory of Economics Department, ul. Rakowicka 27, 31-510 Kraków, Poland, e-mail: witona@uek.krakow.pl
**ORCID** http://orcid.org/0000-0002-4024-2851

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# Productivity or the External Environment: Which is More Important for Growth in Emerging Markets?

**Dzmitry Kruk**

**ABSTRACT**

**Objective:** Assessing and comparing growth promoting effects associated with productivity determinants and external environment determinants in 34 emerging market economies.

**Research Design & Methods:** The study is based on growth regression research design. Two different modelling frameworks – panel OLS and Arellano-Bond GMM estimator – are exploited. The study operates with a unique dataset, covering 34 emerging market economies over 11 years (2007-2017). A traditional set of growth regressors is enriched by the measures of productivity determinants. A set of country-specific measures of the external environment stance are computed and exploited in the modelling framework. Moreover, for capturing numerous attributes of growth promoting effects, the study considers alternative measures of economic growth.

**Findings:** Both productivity and external environment determinants are meaningful for growth in emerging market. However, external environment determinants dominate in explaining short-term growth, while productivity determinants are more important for long-run sustainable growth.

**Implications & Recommendations:** The importance of external conditions for emerging markets should not lead us to incorrect belief that productivity fundamentals do not matter anymore. Changes in the external environment are more likely to generate relatively short-term growth rate fluctuations. Hence, a country aiming to secure sustainable growth should still first of all think about productivity fundamentals.

**Contribution & Value Added:** The study allows to explain recent signs of decoupling between productivity gains and output growth without challenging the foreground role of productivity for generating growth.

**Article type:** research article

**Keywords:** economic growth; TFP; external environment; emerging markets

**JEL codes:** F43, F44, O47, P24, P27

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## INTRODUCTION

As we are close to enter the 4th decade of economic transition in Central and Eastern Europe (CEE), there is a resurged interest in studies about growth in emerging markets (EM). To a large extent, it stems from the contradictions and collisions between growth theory predictions and recent evidence from EM.

The role of productivity (total factor productivity, TFP) gains in EM's growth tends to be the central challenge herewith. Growth theory assumes that TFP gains must be the most powerful channel of growth. Before the Great Recession the majority of empirical studies on emerging markets mainly supported this vision (e.g. Klenow & Rodriguez-Clare, 1997; Hall & Jones, 1999). This view became a kind of near-consensus, although some influential studies (e.g. Young, 1995) argued that capital accumulation was the most crucial for growth in EM.

The evidence from the current decade seems to be challenging that near-consensus on productivity. On the one hand, numerous studies document the deficit of TFP gains for the bulk of EM after the Great Recession (e.g. IMF, 2015, 2016, 2017; Adler *et al.*, 2017). On the other hand, EM keep on growing and output growth definitely outpaces those of productivity (IMF, 2017). Hence, one may argue whether productivity is crucial for growth in EM any more.

Which growth determinant(s) can explain the mismatch between output and productivity growth and fill the gap in understanding the sources of growth in EM? A recent study by IMF (2017) puts external conditions as a key nominee for this role. It argues that just external conditions have contributed substantially to EM's growth, compensating for the lack of productivity gains.

But this kind of response (if accepted) leads to numerous contradictions/challenges. For instance, whether the growth-enhancing effect of external conditions can be theoretically justified and treated as a persistent substitute to productivity. In practice, the latter means whether a current growth path in EM is sustainable. From the economic policy perspective, it puts the issues of good growth-promoting policies again on the agenda. For instance, shall a country refocus from productivity enhancers to securing favourable external conditions (e.g. through economic integration, trade agreements, etc.)?

Documented empirical evidence about the importance of external conditions for EM (e.g. IMF, 2017), is still not the ultimate diagnosis. Studies focused on detecting growth determinants are very sensitive to exploited data and methodology (Acemoglu, 2009; Calderon, Loyaza, & Shmidt-Hebbel, 2006). Hence, the issue of relative importance of external conditions and productivity requires more evidence and research.

This article deals with the subject matter at the 'primary' level of growth research, i.e. at the level of growth determinants. Documenting and assessing explanatory power of alternative growth determinants usually serves as the basis for further theoretical and empirical research. Barro-style growth regressions (Barro, 1991; 2001) is the core element of the research design of the study. However, it is enriched by a number of important ingredients. First, it differentiates between a shorter and longer time-horizon in respect to growth outcomes. Second, a unique dataset has been formed/computed for the study, which allows to control for a wide set of productivity and external conditions determinants. Third, the study employs alternative estimators – OLS fixed effect framework and

GMM Arellano and Bond estimator – for estimating the growth effect of determinants of interest. Dual estimation framework provides robustness check, on the one hand, and secures enough room for economic interpretations, on the other hand.

The objective of the study is to assess and compare growth-promoting effects associated with productivity determinants and external environment determinants in 34 emerging market economies. Herewith, these two groups of determinants are treated as rivals in a sense.

The rest of the study is organised as follows. Section 2 provides a literature review and formulates the agenda for this study. Section 3 is devoted to data description and methodological issues. Section 4 reports and discusses the results. Section 5 concludes.

## LITERATURE REVIEW

Since Solow (1957) a notion that TFP is the major channel of economic growth has become a cornerstone of the economic growth theory. The notion was reapproved within the endogenous growth concept (e.g. Aghion & Howitt, 1992; Grossman & Helpman, 1991; Romer, 1990). However, empirical evidence on the patterns of economic growth is not that straightforward. On the one hand, Hall and Jones (1999), Klenow and Rodriguez-Clare (1997), Wolff (1991) provide empirical support to the theory. On the other hand, Jorgenson, Ho and Stiroh (2005), as well as Christensen, Cummings and Jorgenson (1981) oppose it, stating that the mainstream approach underestimates the role of capital accumulation.

Empirical evidence on growth in EM supplies more food for reflection. Before the Great Recession, the mainstream approach admitted productivity and determinants behind it as the key for explaining growth in EM (e.g. Jones, 2016; Klenow & Rodriguez-Clare, 1997). But herewith the opposing empirical evidence was more convincing, especially at the level of individual countries. Young (1995), showed that the contribution of TFP to output growth in 'Asian tigers' was 'not particularly low, …but not extraordinary high'. Torre and Colunga (2015) showed that in Mexico the contribution of TFP to growth between 1990 and 2011 was negative. Kruk and Bornukova (2014) argued that Belarusian growth was mainly due to capital accumulation. The estimates by De Gregorio (2018) showed that for numerous EM TFP gains between 1990 and 2014 were modest.

After the Great Recession the concerns about the role of productivity in EM's growth intensified. Empirical evidence signals the lack of productivity gains in EM (IMF, 2015, 2016, 2017; Adler *et al.*, 2017; Nezinsky & Fifekova, 2014). Apart from being crucially important itself, this challenge gives a rise to at least two additional concerns in respect to EM.

First, it resurges interest in the role of growth channels[1] in terms of the growth accounting procedure. In other words, if accepting the statement of lowering contribution from productivity, the point of interest is – which channel(s) has/have substituted the TFP one in securing growth in 2010s? For instance, IMF (2017) argue that decreasing TFP contribution during the last 15 years in EM was substituted by the ones associated with capital intensity

[1] The sense of terms 'growth channel (factor)' and 'growth determinant' within this study confirms to the generally accepted one in the literature (e.g. Barro, 2001; Hall & Jones, 1999; Wong, 2001). The term 'growth channel (factor)' denotes the contribution of accumulation of inputs (labor, capital, human capital) and those of TFP gains to growth, basing on the growth accounting procedure. The term 'growth determinant' denotes forces behind growth that may affect it through different channels. Sometimes alternative terminology may be used to denote the same issue. For instance, Acemoglu (2009) denotes growth channels as 'growth proximates', while growth determinants as 'growth causes'.

(mainly) and human capital accumulation (to a lower extent). The latter, if accepted, casts doubts on the sustainability of this new growth regime, given theoretical considerations.

Second, the generally accepted view on growth determinants becomes questionable. The bulk of growth determinants highlighted in the literature may be systemised within three broad groups: institutions (Acemoglu, Johnson, & Robinson, 2001), technologies and ideas (e.g. Jones, 2016), and allocative efficiency (e.g. Hsieh & Klenow, 2009). The determinants within these groups are usually associated with productivity, i.e. they are treated to affect growth through the productivity channel. If there are doubts about the productivity channel itself, these growth determinants should be re-examined as well.

Updating the debate about the role of external conditions in growth performance (e.g. Calderon *et al.*, 2006; Arora & Vamvakidis, 2005), IMF (2017) argue that just external conditions are the growth determinant that have compensated for the lack of productivity gains. However, this kind of explanation does not offset all the contradictions mentioned above. First, if accepting external conditions as an alternative to productivity-based growth, we actually must match corresponding determinants to other growth channels. Hence, shall we think about the external environment as the growth determinant acting through (physical or human) capital accumulation? Nevertheless, the rationale for treating external conditions as the growth determinant emphasizes its engagement just into the productivity channel of growth (Arora & Vamvakidis, 2005). Alternatively, shall we think about more sophisticated mechanisms of the impact of the external environment on productivity?

Second, presumably weakening growth and the strengthening role of external conditions are the phenomena that should be considered in different time dimensions. Treating external conditions as the determinant of long-term growth does not seem evident per se. Justification for linkages between the external environment and long-term growth mainly covers such institutional features of external engagement as trade and financial openness (e.g. Dollar & Kraay, 2003; Edison, Klein, Ricci, & Slok, 2002). But as Calderon *et al. (2006).* show, even these linkages are not robust. In turn, matching such indicators of the external environment as the stance of external demand, trade conditions, financial conditions (e.g. IMF, 2017; Arora & Vamvakidis, 2005) to long-term growth outcomes might be even less theoretically justified. On the contrary, matching them to business cycle /short-term output fluctuations tends to be more natural (e.g. Paweta, 2018; Kaminsky, Reinhart, & Vegh, 2004).

Studying productivity and external conditions at the level of growth determinants (i.e. assessing and comparing their growth promoting effect) might be an important step to assemble the growth puzzle in EM in the last decade. According to Acemoglu (2009, p. 15), this approach serves as 'the input into the types of theories that we would like to develop'. The approach is based on growth regressions pioneered by Barro (1991, 2001) as a tool for studying a conditional distribution of income among countries. However, it requires proper fine-tuning according to the pursued objective.

## MATERIAL AND METHODS

### Methodology

The central element of the research design for this article is the growth regression approach. The original Barro growth regression framework may be summarised as follows (Acemoglu, 2009, p. 83):

$$\gamma_{i,t,t-1} = \alpha * \log(y_{i,t-1}) + \beta * X_{i,t} + \varepsilon_{i,t} \quad (1)$$

where:

$\gamma_{it}$ - output (per capita) growth rate;
$y_{i,t-1}$ - level of output (per capita);
$\alpha, \beta$ - coefficient and matrix of coefficients;
$X_{i,t}$ - growth determinants;
$\varepsilon_{i,t}$ - error term.

However, three types of concerns are associated with this framework. First, numerous technical drawbacks may cast doubts on the results. Acemoglu (2009) summarises these drawbacks for the case of original specification and estimating through OLS as: (a) endogeneity; (b) room for misinterpretation of the economic sense of regression coefficients; (c) weak theoretical background of the approach for open economies. Hence, proper specification of growth regression and estimation technique are critically important for the robustness of the results.

Second, a proper measure of growth on the left-hand side of the regression matters as well. Recalling the concerns about proper matching of external conditions to growth outcomes (either to business cycle or to long-term growth) makes the distinction between output growth rates by time-horizon reasonable. Furthermore, for international comparisons a standard measure of growth (based on domestic SNA statistics) might also contain some drawbacks.

Third, the approach is extremely sensitive to the bundle of the growth determinants considered. Calderon *et al.* (2004) show that contradictions among researchers on growth determinants often occur because they operate with different sets of 'nominees' for growth determinants. For instance, Rodrick, Subramanian and Trebbi (2004) oppose the results of previous research arguing that 'once institutions are controlled for … it 'trumps' everything else'. Hence, the initial set of growth determinants 'nominees' matters and should reflect and correspond to the objectives of the exercise. Similar to this logic, incorporation of growth determinants closely linked with productivity into growth regressions with 'standard' determinants (including those associated with external conditions) might be an important step for puzzling out the collisions between productivity and external conditions in the context of growth in EM.

Bearing these caveats in mind, the growth regression approach in this study is enriched with three additional important ingredients. First, two alternative specifications for growth regressions are exploited – panel OLS fixed effects estimator and Arellano-Bond estimator. The former is better for the economic interpretation and decomposition of actual growth by determinants. The latter is econometrically robust, and serves as the robustness check for the former. Second, the study differentiates among output growth measures (left-hand side of growth regression) in two dimensions: time-horizon and the concept of measurement. Third, following the objective of the study, two groups of 'nominees' for growth determinants are considered – external conditions and productivity determinants. They are treated as 'rivals' in explaining growth outcomes in EM. An important novelty herewith is engaging numerous variables associated with productivity as potential growth determinants into the scope of analysis. Moreover, a unique database of external conditions indicators was formed for the study. Computing procedures for these variables aim at securing their exogeneity in respect to growth indicators.

For mitigating technical drawbacks (b) and (c) of Barro-style growth regression (mentioned above) the field has worked out an augmented approach that incorporates fixed effects model. Bearing this in mind, Acemoglu (2009, p. 85) argues that the following specification is meaningful for studying growth determinants:

$$\log(y_{i,t}) = \alpha * \log(y_{i,t-1}) + \beta * X_{i,t} + \delta_i + \mu_t + \varepsilon_{i,t} \quad (2)$$

where:

$y_{i,t}$ - level of output (per capita);
$\alpha, \beta$ - coefficient and matrix of coefficients;
$X_{i,t}$ - growth determinants;
$\delta_i$ - country fixed effect;
$\mu_t$ - time fixed effect;
$\varepsilon_{i,t}$ - error term.

In many empirical growth studies, to highlight the focus on growth rate (not level) this framework is modified through rearranging the first term from the right-hand side to the left-hand one and implicitly implying the restriction of $\alpha = 1$. Furthermore, for this study the focus on just two groups of growth determinants and treating them as 'rivals' is actualized through the absence of direct control for 'standard' growth determinants (e.g. initial conditions, integration into the global economy, etc.). However, allowing for a constant term, and both individual cross-section and time fixed effect is expected to capture the impact of such determinants. Finally, the following framework is employed:

$$\gamma_{i,t} = \alpha + A * X_{i,t} + B * Z_{i,t} + \alpha_i + \alpha_t + \varepsilon_{i,t} \quad (3)$$

where:

$\gamma_{it}$ - output growth indicators;
$\alpha$ - common intercept
A, B - matrixes of coefficients
$X_{it}$ - the vector of external conditions indicators;
$Z_{it}$ - the vector of productivity indicators
$\alpha_i$ - country-specific fixed effects
$\alpha_t$ - time fixed effect
$\varepsilon_{it}$ - error term.

The specification (3) stems from theoretical considerations (Acemoglu, 2009, p. 85) and includes fixed effects (both in time and cross-section dimension) by definition. Hence, OLS fixed effects estimator is applied herewith (without prior econometric specification tests, e.g. Durbin-Wu-Hausman test).

The specification (3) allows for a meaningful economic interpretation, but there might be doubts in robustness when estimating this specification. Arellano and Bond (1991) show that in cases when the panel is dynamic with rather small T and rather large N, the problem of endogeneity is likely to arise, leading to inconsistent estimates of the model. They worked out an alternative specification that solves the problem of endogeneity. In the application to this study Arellano-Bond estimator is specified according to (4). Following Arellano and Bond (1991), the specification (4) is estimated using generalised method of moments (GMM).

The models (3) and (4) are estimated for 4 different measures of output growth rate (response variables), but with the same explanatory variables. First, output growth rates

are differentiated by the time-horizon. The simplest choice for the response variable is an annual GDP per capita growth rate. However, this rate tends to be too volatile because of the contribution of the business cycle fluctuations. It is worthwhile to get rid of the latter, if bearing in mind the focus on the long-term growth. In other words, we should refocus on the trend[2] of GDP and its growth rate. However, Coibion, Gorodnichenko, and Ulate (2017) show that the vast majority of techniques aiming at getting rid of demand shocks fail to do so. Moreover, full refocusing on the trend growth rate might lead to ignoring that part of variation which could be assigned to demand shocks by mistake. So, we have a kind of a trap. The 'raw' measure of output growth is too volatile and includes unnecessary fluctuations associated with demand shocks. At the same time, it is doubtful to obtain a credible measure of trend growth. In this situation, dealing with both time-horizons and treating corresponding output growth rates as alternative response variables might be a proper solution. Moreover, considering two time-horizons might be useful for detecting the properties of the alternative groups of growth determinants.

$$\gamma_{i,t} = \Gamma * \gamma_{i,t-j} + \mathrm{A} * X_{i,t} + \mathrm{B} * \mathrm{Z}_{i,t} + \alpha_i + \alpha_t + \varepsilon_{i,t} \quad (4)$$

where:

$\gamma_{i,t}$ - output growth indicators;
$\gamma_{i,t-j}$ - lagged dependent variable;
$\mathrm{A}, \mathrm{B}, \Gamma$ - matrixes of coefficients;
$X_{i,t}$ - the vector of external conditions indicators;
$\mathrm{Z}_{i,t}$ - the vector of productivity indicators;
$\alpha_i$ - country-specific fixed effects;
$\alpha_t$ - time fixed effect;
$\varepsilon_{i,t}$ - error term.

Second, output growth rates are differentiated by the measurement concept. A 'standard' one employs the growth rates of real GDP per capita for each country. However, these growth rates might keep too many common factors and 'traces' from the external environment inside themselves. Hence, they might be excessively sensitive to external conditions. Employing relative indicators of countries' well-being (with a common numeraire) and treating corresponding first differences as the measures of growth might eliminate/mitigate 'traces' from external conditions. Hence, the study also employs the speed of closing the income gap (i.e. the ratio between the level of GDP per capita in a country vs. the one in the US[3]) of a country as the alternative measure of its output growth.

According to this concept, a country can 'obtain some reward' for more growth sustainability and less dependence on external shocks. For instance, if a country's growth is more stable than the sample average one, but still close to the sample mean, the 'standard' approach would not stress this country from the mass, while this approach would do this. Moreover, within 'the speed of closing the income gap' approach we can obtain a kind of a natural mechanism for the meaningful comparison of growth in countries with

[2] The terms 'potential output' and 'potential growth' are frequently used in this context, as well. Following the theoretical definition of 'potential output', it might reflect a 'perfect' way to remove demand shocks. But in practice, the term is frequently used in different meanings and I assume different techniques behind it. Hence, in order to avoid the misuse of the term and emphasize an 'imperfect' way of removing demand shocks, I use a more neutral term – trend output.

[3] Levels of GDP per capita measured in Geary-Khamis international dollar (UN, 1992, p. 64)

a substantially different level of well-being. At the same time, this measure by definition would display a strong correlation with the 'standard' growth rate[4].

The values of all explanatory variables are standardised, which secures the comparability of explanatory power by different regressors in the model, basing on the estimated coefficients. Standardised values are computed according to:

$$X_i^{st} = \frac{(X_i - \mu_x)}{\sigma_x} \quad (5)$$

where:

$X_i^{st}$ - standardized value of $X_i$;
$X_i$ - explanatory variable $i$;
$\mu_x$ - mean value of $X$;
$\sigma_x$ - standard deviation of $X$.

The process of estimation assumes a multi-step approach with sequential inclusion of explanatory variables, starting from external conditions indicators, while productivity indicators are included only after them. This procedure assumes to secure the external environment indicators to 'realize all their explanatory potential' and allows tracking for the stability and significance level of the estimated coefficients, which serves as a kind of robustness check. If $Z_{it}$ variables can add and/or 'pull-over' some explanatory effect from $X_{it}$ variables, it would witness the importance of productivity as straightforward growth-enhancers. If the procedure of saturating a model with explanatory variables exhibits robust results (stable and significant coefficients), an opposite exercise is done – sequential cut, i.e. getting rid of insignificant variables. The latter leads to the best specification of a model, which is reported in the article. If models with the same response variables based on the specifications (3) and (4) exhibit similar results, it witnesses robustness of the results. If that is the case, the specification (3) may be used for the decomposition of growth by growth determinants.

**The Sample and Sources of Data**

For the objective of the study, the sample of 36 countries traced by EBRD (2017) is meaningful. Two countries – Kosovo and Uzbekistan – are excluded from the sample, because of the lack of data. So, the sample includes 34 countries: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Egypt, Estonia, Georgia, Greece, Hungary, Jordan, Kazakhstan, Kyrgyz Republic, Latvia, Lebanon, Lithuania, Macedonia, Moldova, Mongolia, Montenegro, Morocco, Poland, Romania, Russia, Serbia, Slovak Republic, Slovenia, Tajikistan, Tunisia, Turkey, Ukraine. From this sample, Belarus and Tajikistan are considered only for growth measurement, but excluded from modelling exercises, because of the absence of data on explanatory variables. The main source of the data is the World Development Indicators (WDI) database of the World Bank.

The period sample is 2007-2017. It is justified for two reasons. First, productivity indicators based on the methodology by WEF (2017) have been available only since 2007. Second, just this period complies with the trend of an increasing role of the external environment for EM (IMF, 2007).

[4] For the sample of 34 countries considered, the coefficient of correlation between these two measures of growth is 0.84.

**Response Variables**

Combining both dimensions – time-horizon and the measurement concept – the study operates with four measures of output growth.

A 'standard' shorter-term growth rate is computed according to:

$$ygr_{i,t} = \frac{Y_{i,t}}{Y_{i,t-1}} \quad (6)$$

where:

$ygr_{i,t}$ - a 'standard' shorter-term output growth rate for a country $i$;

$Y_{i,t}$ - GDP per capita of country $i$ (in Geary-Khamis 2011 international dollars).

A 'standard' longer-term growth rate is computed according to:

$$ygr\_tr_{i,t} = \left(\frac{Y_{i,t}}{Y_{i,t-5}}\right)^{\frac{1}{5}} \quad (7)$$

where:

$ygr\_tr_{i,t}$ - a 'standard' longer-term output growth rate for a country $i$;

$Y_{i,t}$ - GDP per capita of a country $i$ (in Geary-Khamis 2011 international dollars).

A shorter-term growth rate according to 'income gap' concept is computed according to:

$$yf_{i,t} = IG_{i,t} - IG_{i,t-1} \quad (8)$$

where:

$yf_{i,t}$ - a shorter-term output growth rate of a country $i$ according to income gap concept;

$IG_{i,t}$ - the ratio of GDP per capita (in Geary-Khamis 2011 international dollars) in a country $i$ to the one in the US.

A longer-term growth rate according to the 'income gap' concept is computed according to:

$$yf\_tr_{i,t} = \frac{(IG_{i,t} - IG_{i,t-5})}{5} \quad (9)$$

where:

$yf_{i,t}$ - a shorter-term output growth rate for a country $i$ according to income gap concept;

$IG_{i,t}$ - the ratio of GDP per capita (in Geary-Khamis 2011 international dollars) in a country $i$ to the one in the US.

**External Conditions Indicators**

**External demand**

The approach for computing country-specific external demand conditions is based on Arora and Vamvakidis (2005). First, the procedure assumes identifying the major trade partner for each country from the sample. The rule for forming the corresponding list assumes that the share of exports going to major trade partners should not be less than 70% of total exports for each year. Having formed the list, total exports to these countries are assigned as 'new total exports' of the domestic country, and corresponding shares are recalculated basing on it.

Second, macroeconomic variables that are to characterise external demand in trade partners are chosen. A number of options are available here: domestic demand (in trade

partners), imports, GDP, etc. Two from these options are employed: total imports and GDP per capita growth rates. The latter leads to generating two alternative series of external demand. When estimating the models, the series with better explanatory power is included in each model.

Third, the indicator of external demand growth is computed according to:

$$ed\_gr_{i,t} = \sum_{j \in \theta_i} \omega_{j,t} * gr\_dem_{j,t} \quad (10)$$

where:

$ed\_gr_{i,t}$ - external demand growth for a country $i$;
$\theta_i$ - trade partners of a country $i$;
$\omega_{j,t}$ - the share of a country $j$ in a country $i$'s exports;
$gr\_dem_{j,t}$ - indicator of demand growth in a country $i$.

If real imports growth rate is used for $gr\_dem$, external demand is noted as $ed\_gr$. In the case of real GDP per capita growth rate, the notation used is $ed2\_gr$.

**Financial conditions indicator**

Each country is assigned to a specific sub-region, for which financial conditions indicators are computed. The indicator for the corresponding sub-region represents a country in the modelling framework. Eleven sub-regions are considered: advanced EU, South-East EU, South-East non-EU, Central Europe, CIS, Caucuses and Central Asia Oil Importers, Caucuses and Central Asia Oil Exporters, MENA Oil Importers, Asia Pacific, Russia and Turkey. Two large countries – Russia and Turkey – turn out to be too influential for the dynamics of financial flows for the whole region if including them according to the geographical and economic criterions. All other regions consist of a number of countries (the majority of which are not from those 34 considered in the study). For each sub-region the following indicator is computed:

$$fci_{i,t} = \sum_{j \in i} \omega_{j,t}(FDI_{j,t} + PI_{j,t} + OI_{j,t})/GDP_{j,t} \quad (11)$$

where:

$fci_{i,t}$ - financial conditions indicator for a sub-region $i$;
$\omega_{j,t}$ - the share of a country j GDP in $i$'s region GDP;
$FDI_{j,t}$ - foreign direct investments inflow in a country $j$;
$PI_{j,t}$ - portfolio investments inflow in a country $j$;
$OI_{j,t}$ - other investments inflow in a country $j$;
$GDP_{j,t}$ - GDP of a country $j$.

**Trade conditions**

Trade conditions indicator is computed for each country as the ratio between exports and imports prices according to:

$$trc_{i,t} = \frac{x\_p_{i,t}}{m\_p_{i,t}} \quad (12)$$

where:

$trc_i$ - trade conditions for a country $i$;
$x\_p_i$ - exports price index for a country $i$ (2010=1);
$m\_p_i$ - imports price index for a country $i$ (2010=1).

**Productivity Indicators**

Productivity determinants for the study are taken from the database by WEF (2017). WEF (2017) argue that it '…aims to measure factors that determine productivity, because this has been found to be the main determinant of long-term growth'. Moreover, they provide some empirical evidence showing that the indicators have an explanatory power for growth (WEF, 2017, p. 4). They name an aggregate index as Global Competitiveness Index (CGI), but emphasize that understand competitiveness herewith 'as the set of institutions, policies, and factors that determine the level of productivity of an economy' (WEF, 2017, p. 11). CGI consists of 114 indicators grouped by 12 sub-indexes, which in turn form 3 broad groups (WEF, 2017).

The methodology of WEF (2017) assumes that in each year a country obtains a score between 1 and 7 on each indicator, which is the aggregation of corresponding numerous sub-scores on every indicator. However, the criterions on every sub-indicators may change somehow in time, reflecting changing global standards. From this perspective, a progress in any indicator is more a sign of improving country's stance on relative basis (i.e. vs. the frontier economies), rather than on absolute one. For instance, if a country have improved its performance on a particular indicator, but the global (and especially corresponding frontier economies) progress has been more intensive, a score of the country is likely to deteriorate in comparison to previous period. The latter facilitates to the stationarity of the data on individual indicators from panel view (i.e. as a rule, there is no common unit root for a set of countries).

Given their economic sense and statistical properties, WEF sub-indexes are good productivity determinants 'nominees'. However, 12 determinants of productivity as explanatory variables might be redundant, especially taking in mind (i) individual productivity indicators are likely to be correlated with each other, thus causing to multicollinearity; (ii) the lack of degrees of freedom, given that the sample is not so big. Hence, extracting principal components (5 ones for this study) from the whole set of WEF productivity sub-indexes is more reasonable.

**Data Summary**

Table 1 reports the list of the indicators used in the study, their notation and short description.

Specifications (3) and (4) assume that right-hand side variables are stationary. Hence, their stationarity is to be checked. The results of unit root tests are reported in Table 2.

All the series are stationary in terms of panel unit root according to Levin-Lin-Chu test. However, some variables (e.g. trade conditions and the majority of productivity indicators) display the occurrence of individual unit roots (i.e. for individual cross-sections). However, the employed methodology treats panel time-series as integral ones. Hence, panel stationarity according to Levin-Lin-Chu test is a sufficient precondition for estimating the models (3) and (4) without further transformation of the data.

**Table 1. Description and notations for the dataset**

| Notation | Description | Period |
|---|---|---|
| ygr | Shorter-term output growth rate according to 'standard' concept | 2007-2017 |
| ygr_tr | Longer-term output growth rate according to 'standard' concept | 2007-2017 |
| yf | Shorter-term output growth rate according to 'income gap' concept | 2007-2017 |
| yf_tr | Longer-term output growth rate according to 'income gap' concept | 2007-2017 |
| ed_gr | External demand (imports-based measure), growth rate, % per annum | 2007-2017 |
| ed2_gr | External demand (GDP-based measure), growth rate, % per annum | 2007-2017 |
| fci | Financial conditions indicator, index between 0 and 100 | 2007-2017 |
| trc | Trade conditions, index, 2010=100 for each country | 2007-2017 |
| wef_pc1 | 1st principal component out of 12 productivity indicators | 2007-2017 |
| wef_pc2 | 2nd principal component out of 12 productivity indicators | 2007-2017 |
| wef_pc3 | 3rd principal component out of 12 productivity indicators | 2007-2017 |
| wef_pc4 | 4th principal component out of 12 productivity indicators | 2007-2017 |
| wef_pc5 | 5th principal component out of 12 productivity indicators | 2007-2017 |

Source: own study.

**Table 2. The Results of Unit Root Tests for Regressors**

| Series | Test specification | Levin-Lin-Chu | Im-Pesaran-Shin | ADF-Fisher |
|---|---|---|---|---|
| ed_gr | Individual intercept | -10.95*** | -6.56*** | 162.06*** |
| ed2_gr | Individual intercept | -8.85*** | -5.15*** | 137.09*** |
| fci | Individual intercept | -10.48*** | -4.93*** | 130.60*** |
| trc | Individual intercept | -3.86*** | -0.50 | 68.8 |
| wef_pc1 | Individual intercept | -3.40*** | 2.55 | 39.66 |
| wef_pc2 | Individual intercept | -2.78*** | 1.75 | 46.17 |
| wef_pc3 | Individual intercept | -7.42*** | -1.77** | 81.41* |
| wef_pc4 | Individual intercept | -3.32*** | 0.08 | 54.56 |
| wef_pc5 | Individual intercept and trend | -3.69*** | -0.69 | 72.21 |

Notes: all the tests assume unit root as the null hypothesis (panel unit root in case of Levin-Lin-Chu, and individual unit root in case of Im-Pesaran-Shin, and ADF-Fisher tests). The values of corresponding test statistic is provided for each test, with following notations: * – rejection of test null hypothesis at 10% level, ** – rejection of test null hypothesis at 5% level, *** – rejection of test null hypothesis.
Source: own calculations in Eviews 10.

## RESULTS AND DISCUSSION

### OLS Fixed Effects Estimator

Estimated growth regressions specified according to (3) are reported in Table 3.

The coefficients reported in Table 3 and corresponding significance levels are those for 'best' models, i.e. obtained by going through the intermediary procedures of the sequential inclusion of growth determinants followed by the sequential cut of insignificant variables. The values of the coefficients in the 'best' models are close to those during the intermediary steps. Both external conditions and productivity determinants display persistent explanatory power for growth in the estimated models: their coefficients display a high degree of stability and weak sensitivity to the type of specification, both in terms of the values of coefficients and the significance level. This indicates the stability of corresponding coefficients and ro-

bustness of the results to the inclusion of different bundles of growth determinants. Hence, the estimated models are appropriate for economic interpretations.

**Table 3. Growth Regressions Estimated by Panel OLS with Fixed Effects Estimator**

| Explanatory variables | Response variable | | | |
|---|---|---|---|---|
| | Shorter-term perspective | | Longer-term perspective | |
| | ygr | yf | ygr_tr | yf_tr |
| const | 2.28*** | 0.42*** | 2.95*** | 0.51*** |
| ed_gr | 1.10*** | 0.37** | – | 0.15** |
| ed2_gr | – | – | 0.35** | – |
| trc | 1.08*** | 0.27** | 0.57*** | 0.12** |
| fci | 1.83*** | 0.73*** | – | – |
| wef_pc1 | – | – | – | 0.29*** |
| wef_pc2 | 1.47** | 0.71*** | 1.35*** | 0.46*** |
| wef_pc3 | 0.92* | 0.32* | – | – |
| wef_pc4 | – | – | – | – |
| wef_pc5 | – | – | 0.51** | 0.34*** |
| Adjusted R-squared | 0.532 | 0.451 | 0.743 | 0.739 |
| F-statistic | 8.92** | 6.72*** | 21.65*** | 20.7*** |

Notes: The values of coefficients are provided for each variable in each specification with notations regarding the significance level. * – denotes significance at 10% level, ** – denotes significance at 5% level, *** – denotes significance at 1% level.
Source: own calculations in Eviews 10.

The results from the regressions specified according to (3) indicate that: (a) both productivity and external conditions determinants possess explanatory power for growth in EM for both a shorter- and a longer-term perspective; (b) for a shorter-term perspective external conditions determinants are more important for growth rather than productivity determinants; (c) for a longer-term perspective productivity determinants are more important for growth, while external conditions determinants (especially, financial conditions indicator) weaken its impact on growth; (d) growth measured through the concept of 'income gap' displays much more sensitivity to productivity determinants, and less sensitivity to external ones for both time-horizons; (e) together two groups of growth determinants secure much better explanatory power for longer-term growth, while a huge portion of shorter-term growth remains unexplained by this model specification.

The obtained results seem to be quite rich in terms of widening the boundaries of understanding growth in EM and corresponding policy implications. However, one should bear in mind important caveats associated with this modelling framework, first of all, the endogeneity issue.

### Arellano-Bond Estimator

Estimated growth regressions specified according to (4) are reported in Table 4.

The results from the regressions specified according to (4) show that: (a) external conditions determinants dominate in explaining shorter-term growth; (b) in a longer-term perspective the role of productivity determinants increases; (c) for longer-term growth productivity determinants and external conditions determinants are roughly equally important; (d)

the role of individual external conditions determinants differ depending on the time-horizon considered: for shorter-term growth external demand and financial conditions have the largest effect, while for a longer-term perspective this role shifts to trade conditions.

**Table 4. Growth Regressions Estimated by Arellano-Bond Estimator**

| Explanatory variables | Response variable | | | |
|---|---|---|---|---|
| | Shorter-term perspective | | Longer-term perspective | |
| | ygr | yf | ygr_tr | yf_tr |
| y(-1) | 0.29*** | 0.40*** | 1.12*** | 1.16*** |
| y(-2) | -0.12*** | -0.17*** | -0.45*** | -0.56*** |
| ed_gr | 2.07*** | 0.66*** | 0.49*** | – |
| trc | – | – | 0.32*** | 0.10*** |
| fci | 1.93*** | 0.48*** | – | – |
| wef_pc1 | – | – | – | – |
| wef_pc2 | – | – | 0.63** | 0.16*** |
| wef_pc3 | – | – | – | – |
| wef_pc4 | – | – | – | – |
| wef_pc5 | -2.32*** | -0.66** | – | – |
| J-statistic | 25.27 | 18.62 | 24.23 | 22.0 |
| P-value of J-statistic | 0.19 | 0.55 | 0.15 | 0.29 |

Notes: y(-1) and y(-2) denote the lagged value of corresponding response variable for each regression. For instance, for regression with yf as response variable, these regressors are yf(-1) and yf(-2). The values of coefficients are provided for each variable in each specification with notations regarding the significance level. * – denotes significance at 10% level, ** – denotes significance at 5% level, *** – denotes significance at 1% level.
Source: own calculations in Eviews 10.

The results obtained basing on Arellano-Bond estimator are more or less the same, as in case of the panel OLS estimator. The main distinction herewith, the extent to which the explanatory power of productivity indicators grows (and those of external conditions indicator decreases) when shifting from a shorter-term to a longer-term. Arellano-Bond estimator indicates higher relative importance of external conditions determinants in a longer-term (in comparison to OLS fixed effects estimator). However, an important property of a higher growth-promoting effect of productivity determinants in a longer-term in comparison to a shorter-term (and vice versa for external conditions indicator) still holds. Hence, Arellano-Bond estimator confers robustness to the main results.

## Discussion

A 'big picture' of the results obtained according to both specifications of growth regression is more or less the same. It may be summarised as follows.

First, both groups of determinants – productivity and external conditions determinants – possess explanatory power for growth in EM for both a shorter- and a longer-term perspective. This produces a kind of a compromise for the field. On the one hand, the study shows that productivity determinants matter for growth in EM (although not to the extent argued by Rodrick *et al.* (2004), i.e. productivity determinants do not crowd out 'everything else'). On the other hand, it recognizes that external conditions have an important role for

the growth agenda of EM. This conclusion re-echoes with numerous studies arguing about the special role of external conditions for EM (e.g. IMF, 2017; Arora & Vamvakidis, 2005).

Second, relative importance of external conditions determinants and productivity determinants changes when shifting between time-horizons. The longer the time-horizon, the more important productivity determinants and the less important external conditions determinants are. Nevertheless, the latter might not be interpreted in a way that external conditions are associated just with the business cycle fluctuations. Their growth-promoting effect decreases with a longer time-horizon, but it does not decline to zero. This conclusion might be a key for explaining why the role of these two groups of growth determinants substantially differs among studies. If the latter is true, the studies arguing about the pervasive role of external conditions might be 'biased' to a shorter-term, while those praising productivity determinants to a longer-term.

Third, for a shorter-term perspective external conditions determinants are more important for growth rather than productivity determinants. External conditions determinants are responsible for a larger part of growth in the models for both response variables in a shorter-term. Although, their relative importance is somehow lower in the case of the 'income gap' concept. From a policy perspective, this might lead to a conclusion that securing attractive external conditions is more effective for short-term growth rather than securing productivity gains.

Fourth, for a longer-term perspective productivity determinants are more important for growth rather than external conditions determinants. This result may be interpreted in the way that the more we focus on a smoothed growth trajectory (i.e. with business cycle fluctuations netted out), the more important productivity gains are (and vice versa for external conditions). From a policy perspective, it leads to the conclusion that securing productivity gains is the most important task for promoting long-term growth.

Fifth, the composition of external conditions determinants is different for a shorter- and longer-term. For a shorter-term, the largest growth-promoting effect stems from financial conditions. However, in a longer-term it totally disappears. A similar picture arises for external demand: its relative importance decreases substantially (although does not disappear at all) when refocusing from shorter- to longer-term growth. Finally, in a longer-term trade conditions turn out to be the most important external conditions determinant, while being the least important in a shorter-term perspective. From a policy perspective, this might mean that improving financial conditions and external demand can trigger growth only for a short-term perspective. A longer-term growth-promoting effect from external conditions mainly associated with trade conditions. Furthermore, it should be remembered that as a rule external conditions are volatile. Hence, their steady improvement during a longer-term is unlikely, which might further restrict their growth-promoting effect.

Sixth, growth measured through the concept of 'income gap' displays much more sensitivity to productivity determinants, and less sensitivity to external ones for both time-horizons. This might reflect the notion: the more we focus on the qualitative properties of growth (e.g. on its ability to secure well-being convergence, which the 'income gap' concept does), the less influential external conditions determinants are.

While the results obtained according to the specification (3) have passed the robustness check through specification (4), the former may be used for the decomposition of

actual growth in EM[5]. This exercise is helpful to understand the role of determinants behind growth for the whole sample and for the individual countries inside it. Figures 1 and 2 provide the decomposition of shorter-term growth from the period-average perspective by countries (period-average growth is decomposed) and from the sample-average perspective by years (annual sample-average growth is decomposed)[6].

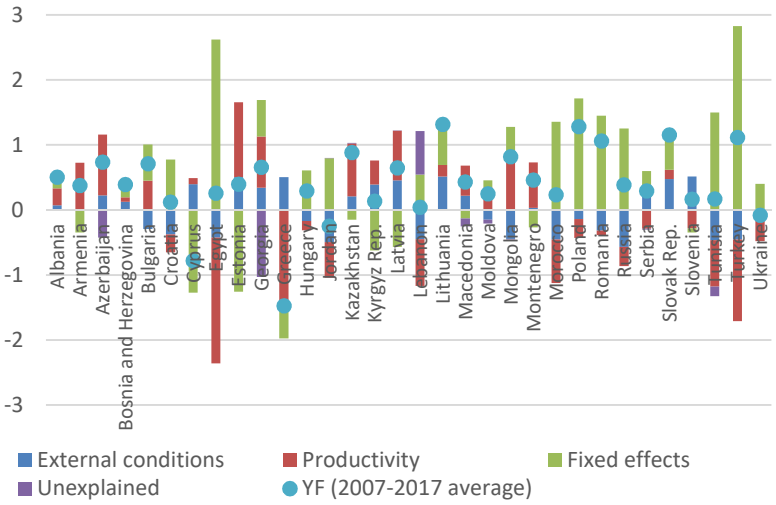


**Figure 1. Decomposition of shorter-term growth (yf) by determinants for individual countries, 2007-2017 average, in p.p. of income gap**

Source: own calculations based on World bank data (available on https://wdi.worldbank.org).

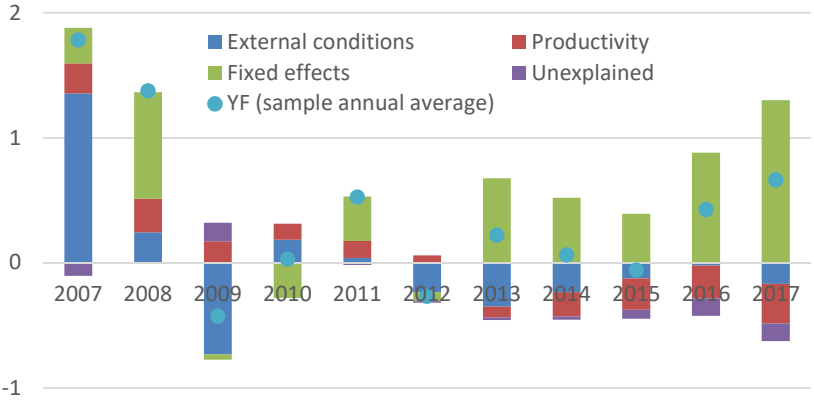


**Figure 2. Decomposition of shorter-term growth (yf) by determinants in 2007-2017, sample average, in p.p. of income gap**

Source: own calculations based on World bank data (available on https://wdi.worldbank.org).

[5] Specification (6) does not allow to do this in a proper manner, as the estimator removes fixed effects from the model.

[6] I report the results of this decomposition exercise only for the growth measured according to the 'closing income gap' concept, i.e. for $yf$ and $yf\_tr$, as the results for 'standard' growth measure are more or less the same.

Shorter-term growth decomposition shows that although external environment is a major driver according to the model, not many countries enjoyed a substantial contribution from it on average basis in 2007-2017. This reflects the notion about poor room for growth due to external condition given their volatile nature. Hence, even from the perspective of short-term growth, the contribution of productivity is rather significant for many countries.

Figures 3 and 4 provide similar decomposition for a longer-term growth.

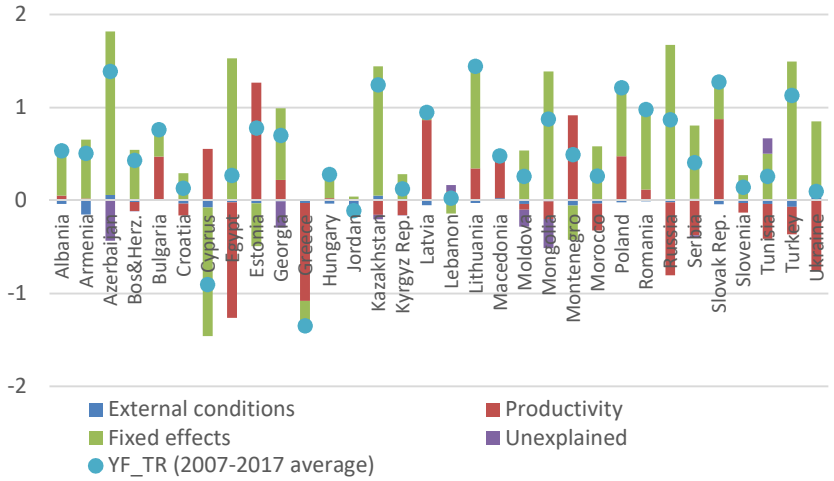


**Figure 3. Decomposition of longer-term growth (yf_tr) by determinants for individual countries, 2007-2017 average, in p.p. of income gap**

Source: own calculations based on World bank data (available on https://wdi.worldbank.org).

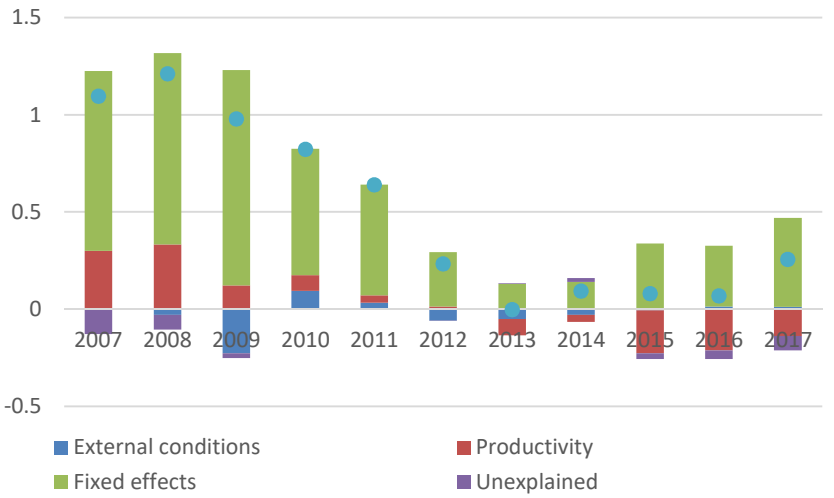


**Figure 4. Decomposition of longer-term growth (yf_tr) by determinants in 2007-2017, sample average, in p.p. of income gap**

Source: own calculations based on World bank data (available on https://wdi.worldbank.org).

For longer-term growth, the contribution of productivity was substantially larger than that of external conditions. At the same time, a huge contribution to growth by fixed effect should be born in mind. It signals that productivity and external conditions determinants are far from explaining growth in EM entirely. From the economic policy view, it also signals that country-specific growth determinants might be also meaningful.

Figure 4 supports a widely accepted evidence of the lack of productivity gains in EM in recent years. However, jointly with Figure 3, it proves that for the whole set of EM this fact stems from very heterogeneous role of productivity in individual countries. However, countries with higher productivity gains still exhibit a higher trend growth. This sheds some more light on the phenomenon of decoupling between productivity and growth and allows to explain it within the framework where productivity is still the major growth driver.

## CONCLUSIONS

The article deals with the issue of relative importance of productivity determinants vs. external conditions determinants for growth in EM. It shows that both productivity and external environment determinants are meaningful for growth in EM. However, it is crucial to differentiate between a shorter and a longer-term perspective, as the role of productivity and external conditions determinants changes depending on the time-horizon. In a shorter-term, external conditions determinants are more important for growth. Herewith, external demand and financial conditions are of prior importance. Among the external environment determinants, trade conditions take up their role in a longer-term, while the role of external demand and financial condition weakens in comparison to those in a shorter-term. But in overall, productivity determinants become dominant in a longer-term. It means that productivity is still meaningful for growth and the longer the time-horizon considered, the more important productivity determinants are.

The results of this study, one the one hand, are similar to IMF (2017) and Arora and Vamvakidis (2005), as showing the importance of external conditions for growth in EM. On the other hand, they differ somehow, as stating that in a longer time-horizon productivity becomes more important for economic growth, while the role of external conditions is contracting. In this part, the results of the study are more in line with Rodrick *et al.* (2004). Moreover, the article provides a framework where the 'growth puzzle' in EM – decoupling between output and TFP growth rates – can still be explained without challenging the foreground role of productivity for economic growth.

From the perspective of growth-enhancing policy, the article shows that the importance of external conditions for EM should not lead us to incorrect belief that productivity fundamentals do not matter anymore. Changes in the external environment are more likely to generate relatively short-term growth rate fluctuations, while having a modest impact on the sustainable growth trajectory. Hence, a country aiming to secure sustainable growth should still first of all think about productivity fundamentals.

The study also contributes to some more narrow issues of economic research. The evidence that growth measured according to the concept of 'the speed of closing the income gap' is more sensitive to productivity determinants rather than the 'standard' growth rate, might be an argument for more regular employment of this measure in stud-

ies dealing with international comparisons. The evidence of the sensitivity of growth regressions to inclusion of productivity determinants re-echoes with Rodrick *et al.* (2004), and might be born in mind when exploiting the tool.

The research design of this study has got a number of limitations. First, because of data availability it deals with a relatively short time horizon and a small number of countries. Expanding the framework both in the time and space dimension might be worthwhile. Second, focusing on 'competition' between external conditions determinants and productivity determinants, the study left out of consideration a number of alternative growth determinants. This led to leaving a substantial part of growth in EM either unexplained or assigned to country-specific/time fixed effects. Third, concentrating on the level of growth determinants, the study does not match its effects to growth channels, which might be the contribution to the theory. Directions for future research are associated with overpassing these limitations.

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## Author

**Dzmitry Kruk**

Researcher at Belarusian Economic Research and Outreach Center (BEROC), PhD student in Cracow University of Economics. His research interest includes: growth and finance, growth in emerging markets, monetary policy.

**Correspondence to:** Mr. Dzmitry Kruk, BEROC, Gazety Pravda ave. 11-B, Minsk, 220018, Belarus, e-mail: kruk@beroc.by

**ORCID** http://orcid.org/0000-0003-3770-9323

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# The Capacity of JESSICA Projects to Repay Loans Based on Own Revenues

**Piotr Idczak, Ida Musiałkowska**

**ABSTRACT**

**Objective:** Objectives of the article are the following: to identify 1) similarity/ dissimilarity in Polish regions with regard to the implementation of JESSICA projects in terms of the size of JESSICA loans/ projects and the legal form of beneficiaries, 2) what factors have the biggest impact on the project capacities to generate revenues.

**Research Design & Methods:** The authors used the logistic regression to build a model showing the association of the variables analysed on the dependent variable. In addition, to point out a relative importance from all possible orderings of explanatory variables and to show the most important one(s), ANOVA method was applied.

**Findings:** Not all the projects co-financed under the JESSICA initiative bring revenues from their main operations. The legal form of a beneficiary plays an important role. Both projects implemented by companies and projects of a relatively high value increase the probability of generating revenues. Location of the project (capital city/ non-capital city of the region) is not significant with regard to capacities to generate revenues.

**Implications & Recommendations:** JESSICA projects characterised with a high value and implemented by entities having the company status involve private capital and consequently generate capital backflows. They contribute to leverage effects and thereby raise the role of JESSICA as a powerful instrument aimed at rendering existing market failures. It seems that the results of the study might help to design the use of JESSICA resources in the current and the future EU financial perspective.

**Contribution & Value Added:** The article sheds more light on a still under-researched area of the use of financial instruments in the EU Cohesion Policy. The analysis provides pioneering results and points out the vital issues for future research.

| | |
|---|---|
| **Article type:** | research article |
| **Keywords:** | JESSICA; Poland; regeneration; revenue-generating projects; Cohesion Policy |
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## INTRODUCTION

Urban areas, being in the focus of the study, require investment in urban infrastructure, heritage and cultural sites, deprived areas, housing, etc. Nevertheless, the financial resources of public and private entities have not been sufficient to respond to high demand in cities. Apart from grants and loans coming from the banking sector, there has been a new initiative introduced at the European level by the European Commission together with two public banks: the European Investment Bank and the Council of Europe Development Bank – the JESSICA (Joint European Support for Sustainable Investment in City Areas) initiative. The support offered under JESSICA is based on the use of the Cohesion Policy structural funds in a form of repayable financing. There are, however, still surprisingly few studies looking into a different nature of such financial aid (Bode, 2015; Dąbrowski, 2014, 2015; Fotino, 2014; Musiałkowska & Idczak, 2016; Nadler & Nadler, 2018). The majority of evaluation reports were done before or in the mid 2007-2013 financial perspective – for Śląskie and Pomorskie regions (CCI, 2010; EIB, 2010b) or Mazowieckie Region (EIB, 2011) and do not provide answers to in-depth research questions regarding e.g. the capacities of projects to ensure the repayability of JESSICA funding.

As reported by the authors in a previous study, one out of three projects implemented within the framework of JESSICA initiative does not generate any revenues (Musiałkowska & Idczak, 2019). In addition, these preliminary findings suggest that the most desired projects from the JESSICA perspective are those of a high value and designed by private entities. These kinds of projects not only can provide revenues needed to fully cover the operating costs but also to ensure the repayment of the loan. To the authors' knowledge, there is no other empirical study to date that has considered JESSICA from the point of view of the project implementation. Therefore, the main objective of this study is to investigate the impact factors that may affect the capacities of the projects to generate revenues on the basis of their primary business activities. Special interest is in how variables such as the legal form of the beneficiary, project location, project value, value of the JESSICA loan, the region implementing the JESSICA initiative, the bank providing JESSICA loan influence the project capacities to generate own revenues, if any.

We concentrate on this intuitively obvious issue, taking into account the fact that the basic tasks of the JESSICA initiative are to develop an effective process for supporting urban development by revolving funds and to enhance and accelerate a potential for new investments in urban areas. According to the preliminary rules, only projects that generate return flows are eligible for funding offered by this instrument and the repayment should be achieved either in the form of solely commercial returns or project revenues secured directly by investors from other sources (Musiałkowska & Idczak, 2018a). In our previous study we found out that not all projects bring revenues from the commercial returns and that the form of a beneficiary (public or private) matters. Thus, in order to achieve the objective set out, this study seeks to address the following specific issues: Which of the variables analysed significantly contributes to achieving capacities to generate own revenues by JESSICA projects? Which of the variables considered has the greatest impact on

the project capacity to generate own revenues? Are there any differences between regions with regard to the number of projects that have received revenues from primary business activities? How does the project capacity to generate own revenues vary spatially in particular regions? Which projects meet the JESSICA requirements to the greatest possible extent? By providing answers to these questions, the study can shed further light in the debate on the implementation of revolving instruments in the regional and urban policy. Moreover, our study provides further evidence for the functioning of the JESSICA initiative and thereby bridges a gap in the literature on it.

The article is structured as follows. Section two describes briefly the JESSICA initiative in Poland. Section three provides details on data and methodology and is followed by section four that outlines the results and discusses the factors mostly influencing a project capacity to generate own revenues. The final section concludes with a brief discussion on the implications of the findings for the policy practice.

## LITERATURE REVIEW

This new and innovative initiative – JESSICA – was created in order to increase the amount of money for investments related to sustainable development and regeneration processes in cities in the 2007-2013 financial perspective. The initiative that is implemented in the framework of the Cohesion Policy uses the resources of one of the structural funds – the European Regional Development Fund – in the form of revolving instruments (loans, guarantees), allowing for e.g. achieving the multiplier effect of the actions implemented (Memorandum of Understanding, 2006). JESSICA was developed by the European Commission in cooperation with the European Investment Bank (EIB) – which can act as a trust fund manager and which works in cooperation with the Council of Europe Development Bank (CEB). In the years 2007-2013, this initiative was applied in 11 EU countries, including Poland (European Commission, 2014). In all five Polish regions: Mazowieckie, Pomorskie, Śląskie, Wielkopolskie, and Zachodniopomorskie that decided to implement JESSICA, the EIB was a beneficiary of the measures of regional operational programmes and performed a function of the so-called holding fund that cooperated with the specialised Urban Development Funds (that is: Bank Gospodarstwa Krajowego – BGK, Bank Ochrony Środowiska – BOŚ and Bank Zachodni WBK S.A. – BZWBK S.A.), namely entities responsible for the selection of projects and providing co-financing to them (Musiałkowska & Idczak, 2018a).

JESSICA involved repayable funding which, contrary to grant-based assistance commonly available within the framework of CP, was intended to provide in general private investors with incentives to encourage them to develop projects aimed at redressing imbalances in urban areas (Nadler & Kreuz, 2011). The main strength of such a kind of funding was to trigger the catalytic effect of private as well as public capital available on the market, and thereby leverage other resources, in addition to EU Structural Funds, for urban renewal. The basic rule relies here on reinvesting both revenues generated by the investments and the reimbursement of principal amount in other urban projects (EIB, 2010a, pp. 45-48). This, in turn, means that only projects generating return flows, that is repayable investments, in principle can be financed from JESSICA funds (Mazars, 2013, pp. 10-11). Since the generation of capital backflows is mandatory, projects should show an adequate level of financial profitability. In other words, they should ensure, in

a dynamic capital budgeting analysis, cash inflows raising from sale revenues (i.e. flows directly paid by users for the goods or services provided by particular projects) that allow for retaining the profitability within the meaning of the financial internal rate of return (Arup, 2009, pp. 44-46; Nadler & Nadler, 2018). In this context, projects should be characterised by a long-term viability and demonstrate a high self-financing level. Moreover, JESSICA was deemed to be a powerful catalyst for mobilising additional financial resources to encourage public-private partnership (PPP) solutions focused on the implementation of urban development projects (Held & Jakubowski, 2009).

JESSICA, in general, supports projects in the following areas: urban infrastructure (including for transport, water and sewage systems or power), heritage or places relevant to culture (contributing to the development of tourism or another permanent use), development of brownfield sites (including cleaning and decontamination of the areas), creation of new commercial premises for small and medium-sized enterprises, development of information technology and research and development works, expansion of university buildings and improving energy efficiency (European Commission, 2013a). Almost all types of legal persons enumerated in the Polish law were eligible to apply for funds (for more see sections 3-4).

According to the European authorities involved in the design of the Cohesion Policy, this initiative should bring a number of benefits, of which the most important are the following (European Commission, 2013b):

- generating profits through projects implemented using financial engineering instruments,
- occurrence of leverage – by combining structural funds with other existing sources of funding,
- the initiative is to provide flexibility in structural terms regarding the usage of funds (in the form of equity, debt or guaranteed investments, which can be adapted to the specific needs of countries and regions),
- gaining know-how from private investors, which aims to facilitate the acquisition of further investments in the coming years and provide technical and financial performance in the implementation phase of the project and during its management,
- an increase in establishing partnerships between stakeholders such as: countries, regions, cities, EIB, CEB, other banks, investors, in order to solve problems of urban areas,
- emphasis put on the so-called social aspect of the projects, estimated based on the advantage of positive externalities of an urban project (the so-called social elements) over the commercial part of an investment,
- bigger complexity and diversity of the projects when comparing to the grant system (e.g. shopping malls, business incubators, office space, dormitories, hotels, underground parking, etc.).

The values of the available funds under JESSICA differed among the regions. Wielkopolskie region allocated the biggest amount of 66.3 mln EUR, while Zachodniopomorskie region allocated the lowest amount that accounted for half of Wielkopolskie region allocation, namely 30 mln EUR (Musiałkowska & Idczak, 2018a). The projects of the highest values (and the highest value of the JESICA loan) were implemented in Zachodniopomorskie region, whereas the biggest differentiation in terms of the project values was observed in Pomorskie region (Figure 1).

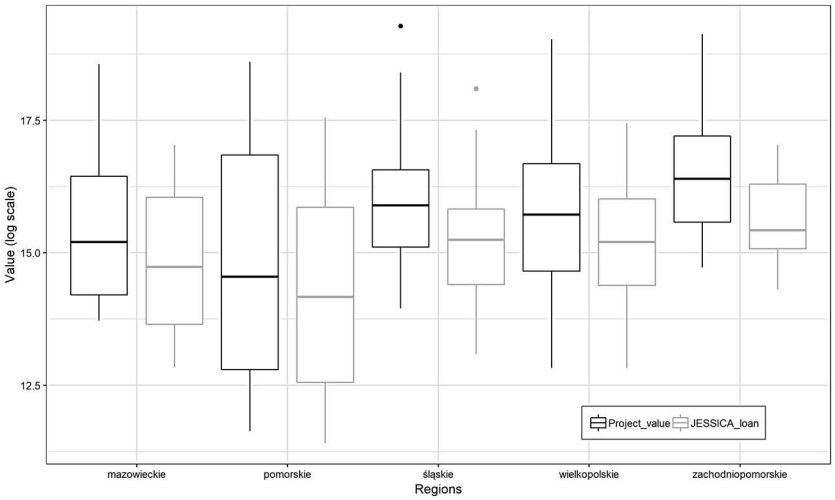



**Figure 1. The value of JESSICA projects and loans in Polish regions (log scale)**
Source: own elaboration.

## MATERIAL AND METHODS

The empirical analysis in this study covers all projects implemented within the framework of the JESSICA initiative in Poland during the 2007-2015 period[1]. The investigation presented here draws on data collected from the following sources: the Marshall Offices of all regions implementing the JESSICA initiative and institutions acting as managers of the Urban Development Funds. In addition, this database was completed with information about the legal form of beneficiaries from the National Court Register. The other data regarding projects was supplemented by the results of examination of other sources, such as project descriptions, policy reports, and field studies. Secondary sources, in particular multiple online resources, were also used to find missing information.

In order to meet the goals identified above in the introduction, we undertook a four-pronged approach. First, we identified how many projects have received revenues from primary business activities, and which of them have gained revenues derived outside their main operations. We wanted to expound whether the capacities of JESSICA projects to generate own revenues vary in certain attributes and factors that may affect the performance of the JESSICA initiative. First of all, we aimed to examine if there is any statistical dependency between the project capacity to generate own revenues and the amount of JESSICA funding or the value of JESSICA projects. Furthermore, we considered the legal form of the beneficiary as an important factor that may also have an impact on the project capacity to generate own revenues. Generally, the beneficiaries represent 20 different types of legal forms. Therefore, for the purpose of statistical calculations, we grouped them first into two main categories: 1) public entities – acting in the widely defined social

[1] N+2 rule was taken into account when considering the implementation of the projects.

and public interest and 2) private entities – operating for profit. In the next step, we extracted within each category those types of beneficiaries that largely outnumbered the other types. We decided to investigate as a separate legal form those of the entities that have a company status. The same procedure was used to take a local government authority as a separate legal form as well. The rationale behind this is the fact that they represent legal forms of the two largest groups of beneficiaries. Another factor taken into consideration in the study was location. Due to a relatively small number of projects in our study population (161), location was analysed in dichotomous terms, that is, whether the projects were implemented in the capital cities of the regions or in areas situated outside the capital cities. Additionally, the analysis also covered two other factors, namely region and urban development fund. By doing so, we wanted to find out whether these factors could influence the capacities of the projects to generate own revenues.

Second, we examined the dependence existing between all of the variables included in the study. Since the assessment of the statistical significance relies here upon comparing different groups of measures (numerical and categorical data), we applied the Wilcoxon rank sum test with continuity correction. It is a non-parametric test and can be used to compare two independent groups of the sample[2].

In order to explain whether the JESSICA projects are characterised by the capacity to generate revenues from their primary business activities, we used a logistic regression that allows us to estimate the probability of a binary response variable (Y) based on predictor variables (X) (Lever, Krzywinski, & Altman, 2016). The model in the simple form is the following:

$$\log\left(\frac{p(X)}{1-p(X)}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_X X_X \quad (1)$$

where the odds ratio is defined by the function of the probability of success, that is, of having capacity to generate revenues $(Y = 1)$ which is given by the fact that a particular project is a revenue-generating project, and the probability of failure otherwise. $\beta_0$ is the fixed component and is an integral part of the model, while $(\beta_1, \beta_2, \dots, \beta_p)$ are regression coefficients associated with particular independent variables and must be estimated with the use of the maximum likelihood. $(X_1, X_2, \dots, X_p)$ stand for *p* predictors and are respectively: *type of the beneficiary; company status; local government authority status (LGA),* etc.

Finally, because we used multiple predictor variables in the regression model we also wanted to find out which variable is the most influential in predicting the binary response (Y) variable. This was done by applying ANOVA analysis that assesses potential differences in a ratio-scale dependent variable by categorical independent variables. All calculations were done in the R statistical package (R Core Team, 2018).

## RESULTS AND DISCUSSION

As mentioned before, JESSICA projects should have a long-term viability and demonstrate a high self-financing level. However, as Table 1 shows, nearly one in every three projects

[2] It is assumed that it tests with the null hypothesis that the distribution of given measurements in population X is the same as that in Y – to put this more precisely, the median difference between the first and the second measurement groups amounts to zero. If the medians of two populations differ, it points to a difference in the shapes of two distributions.

implemented under the JESSICA initiative in Poland does not provide any financial profitability but also no revenues. Against this background, Zachodniopomorskie region stands out notably as a region where all projects feature the capacities to generate revenues on the basis of their primary business activities. In turn, at the bottom of the ranking is Pomorskie region in which more than a half of projects (53.33%) do not demonstrate any revenues. In all remaining regions, this relationship remains at the level that is close to the general average. What is surprising is the fact that the framework of the JESSICA initiative did not provide for a desired scale of long-term viability. It is worth noting that, indeed, in many projects (32.2%, Table 1) the repayment of the loan was not been made from sale revenues but was secured by investors from other sources. Taking into account the assumption related to the meaning of category 'revenue-generating projects' (see footnote 2), it is likely to be that the number of the non-profit projects is even higher.

**Table 1. Number of the JESSICA projects implemented in 2007-2015 according to the capacity to generate revenues**

| Type of project | Mazowieckie region | Pomorskie region | Śląskie region | Wielkopolskie region | Zachodnio-pomorskie region | Total |
|---|---|---|---|---|---|---|
| Revenue-generating projects (RGP) | 23 | 21 | 20 | 26 | 19 | 109 |
| (percentage) | (74.19) | (46.67) | (76.92) | (65.00) | (100.00) | (67.70) |
| Non-revenue-generating projects | 8 | 24 | 6 | 14 | 0 | 52 |
| (percentage) | (25.81) | (53.33) | (23.08) | (35.00) | (0.00) | (32.30) |
| ***N*** | **31** | **45** | **26** | **40** | **19** | **161** |

Source: (Musiałkowska & Idczak, 2018a).

In order to provide an additional explanation in the research, further analysis is focused on factors that may have an impact on the capacities of projects to generate revenues based on own resources. By doing so, we can point to these factors as well as these projects which best reflect the assumption of JESSICA. Table 2 presents the most relevant categories of beneficiaries of JESSICA funding in terms of their legal status and other factors relevant for the study. As illustrated in Table 2, nearly half out of 57 beneficiaries clustered as public entities had to arrange other revenues than those stemming from charges paid by the users. Interestingly, a clearly distinguishable situation from other regions can be seen in Pomorskie region where a relatively high number of projects implemented by private entities was reported (32 out of 45) of which more than every second, on average, is able to generate revenues. When comparing these data, one may find this as a highly puzzling issue in particular because of the large number of 'private' projects (14 out of 32) that did not report any sale revenue from the core business. A similar situation occurs also in other regions (except for Zachodniopomorskie region) but the share of non-revenue generating projects run by private entities is incomparably slight. The reason for this rather unexpected results can be accounted for by the fact that this type of beneficiaries also covers as project promotors housing cooperatives and housing communities. They implemented projects on 'energy efficiency improvements' which consisted, among others, in the modernisation of boiler plants, replacement of heating networks and im-

provement of the thermal insulation of buildings, and also, for instance, in the modernisation of car parks and other infrastructural elements of a residential estate area. Those projects have undoubtedly made substantial contributions to achieving the savings in heat and energy consumption, and thus improving the environment and achieving the objective of social cohesion in a wider perspective. Nonetheless, this kind of projects does not provide sales revenues and thereby does not ensure any operational margin, and therefore the projects are financially unsustainable.

If one looks at the data relating to the location of JESSICA projects, the results show that at the general level a substantially larger number of projects was implemented in areas situated outside the capital cities of the regions (respectively compared 90 to 71). In this regard, the revenue-generating projects in both areas have a similarly high share. However, the situation varies within particular regions. For instance, Mazowieckie region almost doubled the number of projects implemented in other cities than the capital one, and in Wielkopolskie region more than three-fourths of projects were executed outside the capital city of the region. Hence, this is in contrast with what happened in Pomorskie region where two out of three projects were run within the Tricity. The figures concerning the capacity of project to generate own revenues in this context present a mixed picture. The same can be concluded as far as the Urban Developments Funds are concerned, where the data representing the share of the revenue-generating projects show a diverse picture as well. It should be noted, however, that the only outlier from the entirety of the figures seems to be Zachodniopomorskie region that is markedly different from other regions, in a positive sense of the line of the argument of this study.

The main goal of the subsequent analysis is to identify what factor contributed mostly to achieving the main assumptions of the JESSICA initiative. As stated in the Introduction, the research was carried out in order to examine the capacities of projects to generate revenues obtained from primary business activities of investors. To be more precise, we want to find out whether the capacities of projects to generate own revenues vary, for instance, in the amount of JESSICA funding or in the value of JESSICA projects. Moreover, we intend to reveal if there are other important factors such as legal form of beneficiaries, project location, UDF etc., that may affect the project capacities to generate own revenues and thereby could reflect an effect on the performance of the JESSICA initiative. For this reason the article now turns to investigate the relationship between the project capacities to generate own revenues and other variables to find the statistical dependences. To do so, we used the Wilcoxon rank sum test.

The results of the Wilcoxon rank sum test are displayed in Table 3. What clearly emerges from this table is the existence of the significant differences between the examined groups of variables. We can conclude that the variable 'project capacities to generate revenues' is significantly different when it comes to almost all variables, except for 'location' where the results show that the medians of both variables are almost equal with $W = 2839.5$ and $p\text{-value} = 0.9832$. Furthermore, results also highlight arelatively strong dependence between the variable Y and the value of the JESSICA project, which was confirmed by the output of calculations: $W = 765$, $p\text{-value} = 7.555e\text{-}14$. The same procedure was conducted regarding the statistical link between, on the one hand, the type of the beneficiary and the location, and on the other, the values of a JESSICA project

and the value of JESSICA loan. We found that there are no significant differences between the location and the value of a JESSICA project as well as the JESSICA loan. This can be seen from the level of *p-value*, respectively *0.9959* and *0.8755,* which is higher than the significance level. For what concerns the relationship between the type of the beneficiary and both values, the test showed insufficient evidence with a *p-value = 0.06604* in order to state that the distribution of the variable of the values of the JESSICA project differs significantly from that of the variable of the type of the beneficiary – it is rather weak. In brief, the most marked observation to emerge from the data analysis conducted so far is that the location, admittedly understood in dichotomous terms, seems not to be a relevant factor in the assessment of the JESSICA initiative.

**Table 2. The number of JESSICA projects by legal form of the beneficiaries, location and UDF**

| Term | Mazowieckie region | Pomorskie region | Śląskie region | Wielkopolskie region | Zachodnio-pomorskie region | Total |
|---|---|---|---|---|---|---|
| Public entities | 11 (6) | 13 (7) | 15 (8) | 20 (7) | 2 (2) | 57 (30) |
| - including local government authorities | 5 (3) | 8 (5) | 7 (6) | 18 (6) | 2 (2) | 40 (22) |
| Private entities | 20 (17) | 32 (14) | 15 (12) | 20 (19) | 17 (17) | 104 (79) |
| - including Companies | 18 (17) | 15 (14) | 12 (11) | 19 (18) | 16 (16) | 80 (76) |
| Location in the capital city of the region | 11 (5) | 31 (14) | 12 (12) | 9 (9) | 8 (8) | 71 (48) |
| Location outside the capital city of the region | 20 (18) | 14 (7) | 14 (8) | 31 (17) | 11 (11) | 90 (61) |
| Urban Development Fund | | | | | | |
| - including: BGK | 31 (23) | 32 (14) | | 40 (26) | | 103 (63) |
| BOŚ S.A. | | 13 (7) | 26 (20) | | 10 (10) | 49 (37) |
| BZ WBK | | | | | 9 (9) | 9 (9) |
| **Total (N)** | **31** | **45** | **26** | **40** | **19** | **161** |

Numbers of projects generating revenues are presented in parentheses.
Private entities include a broad category of actors registered according to the Polish law as companies, non-governmental organisations, etc. We aggregated all beneficiaries into two main groups: public and private.
The term 'capital city' used in the table refers, as a rule, to capital city of the particular region, however with the exception of regions, i.e. Pomorskie region and Śląskie region, where, due to their specificity and agglomerative linkages, one continuous urban area covers more than the only one main city. Thus, in Pomorskie region the term 'capital city' comprises three cities: Gdańsk, Gdynia, Sopot, that is, the so called Tricity, and in Śląskie region it applies to the Upper Silesian conurbation including the cities: Chorzów, Dąbrowa Górnicza, Gliwice, Katowice, Ruda Śląska, Sosnowiec, Świętochłowice, Zabrze.
Source: own study.

A further interesting aspect of the analysis refers to the examination of the relationship between our dummy dependent variable and other variables that influence (explain) whether or not the JESSICA projects have the capacity to generate revenues on the basis of their primary business activities. The final set of explanatory variables (X) used in the estimation includes the following: *type of the beneficiary; company status; local government authority status (LGA); region; urban development fund (UDF)* and *value of the JESSICA project*. The other variables considered, as for instance *location* and

*value of the JESSICA project* were finally rejected due to their strong correlation with the others (for more see Figure 1 and Table 3).

Table 4 presents the coefficient estimates and other information that result from fitting our logistic regression model in order to predict the probability of having capacities to generate revenues by the projects. According to these results, it can be seen that only two variables suggest a statistically significant relationship in relation to our response variable, that is, *Company status – YES* and *Value of the JESSICA project*. When looking at the estimates, one can observe that the coefficients are positive and amount to $\beta_{\text{Company status}}$ = 3.49289 and $\beta_{\text{Value of the JESSICA project}}$ = 0.87224. This indicates that an increase in both variables is associated with an increase in the probability of having capacities to generate revenues by the projects. The findings indicate that the odds ratio that a project has the capacity to generate revenues is 3.5 times higher for projects which were implemented by entities having the company status compared to other entities having different legal status. In turn, in the case of the second significant variable – *value of the JESSICA project* – which is a continuous predictor, the estimate can be interpreted as – for every one unit (log scale) increase in the value of the JESSICA project the odds ratio of having capacities to generate revenues by the projects increases by 87%. Thus, it can be generally concluded that the projects with the highest capacity for producing revenues on the basis of their primary business activities are those of high value and implemented by investors with the company status. One possible explanation for this is that large projects run by companies encompass a wide range of actions that are strictly geared to achieving the required profit. These kinds of investments target actions necessary to achieve the project objectives but also to generate return on investment, which covers both investment and operating costs, and makes a profit. It is also found that there is no significant relationship between regions, urban development funds and the project capacities to generate revenues.

**Table 3. Identification of differences based on the Wilcoxon rank sum test**

| **Comparison of the two distributions** | ***W*** | ***p-value*** | **Comparison of the two distributions** | ***W*** | ***p-value*** |
|---|---|---|---|---|---|
| As 'Y' *project capacities to generate revenues* | | | As 'Y' *type of the beneficiary* | | |
| value of the JESSICA project | 765.0 | 7.555e-14 | value of the JESSICA project | 3692 | 0.01012 |
| value of the JESSICA loan | 981.0 | 2.128e-11 | value of the JESSICA loan | 3484 | 0.06604 |
| type of the beneficiary | 3798.0 | 3.588e-05 | location | 3357 | 2.043e-05 |
| location | 2839.5 | 0.9832 | As 'Y' *location* | | |
| companies | 1076.0 | 2.194e-13 | value of the JESSICA project | 3193 | 0.9959 |
| local government authorities | 3243.0 | 0.04849 | value of the JESSICA loan | 3241 | 0.8755 |

Significance levels: statistically significant at the p<0.05 level.
Source: own study.

A closer look at the other predictors reveals that they became insignificant in explaining the probability of having capacities to generate revenues by the projects. The p-values associated with most of these variables are very high, indicating that there is no statistically significant association between these explanatory variables and our response variable. However, the positive value of the coefficient estimate for the *type of the beneficiary – public*, by the way of illustration, points out that public entities are more likely to implement projects generating revenues than the private ones. The same

also refers to the *LGA status – YES* where an increase in LGA status is associated with an increase in the probability of generating revenues. These findings seem to contrast with an earlier study by (Musiałkowska & Idczak, 2018a) highlighting that the capacity of projects to generate revenues is higher when they are implemented by private entities. There is a possible explanation for this outcome. Private entities tend to generate profits more frequently than public ones, which causes them to have higher probability of occurring capacities to generate revenues when the company status is not considered. However, if we exclude from the group 'private entities' those with the company status, it turns out that they have an overall higher probability of generating revenues than other forms. Thus, when using many predictors public entities may show a higher probability of generating revenues than private ones because the latter also cover a number of entities that do not generate profit (for instance, housing associations and communities). Given that these findings are based on an insignificant association between variables, the results from this part of the analysis should thus be treated with the utmost caution (for more see Wasserstein and Lazar, 2016). Generally, it can be stated that this study provides a more detailed insight into the matters of the factors affecting the probability of generating revenues. The effect display for all of the predictors included in the model to explain the project capacities to generate revenues can be seen in Figure 2.

**Table 4. Coefficients of logistic regression for the JESSICA projects implemented in Poland**

| Term | Estimate | Std.error | Statistic | p.value | Deviance Residuals | |
|---|---|---|---|---|---|---|
| Intercept | -14.04977 | 3.64180 | -3.858 | 0.000114 *** | Min | -2.2990 |
| Type of the beneficiary – public | 0.93195 | 0.99125 | 0.940 | 0.347125 | 1Q | -0.2367 |
| Company status – YES | 3.49289 | 1.01945 | 3.426 | 0.000612 *** | Median | 0.1455 |
| LGA status - YES | 0.51902 | 0.69037 | 0.752 | 0.452173 | 3Q | 0.4391 |
| Region – Pomorskie | -0.67245 | 0.93601 | -0.718 | 0.472498 | Max | 1.7985 |
| Region – Śląskie | -0.09454 | 1.31065 | -0.072 | 0.942498 | | |
| Region – Wielkopolskie | -0.86111 | 0.72293 | -1.191 | 0.233596 | | |
| Region – Zachodniopomorskie | 15.67709 | 1708.99057 | 0.009 | 0.992681 | Pseudo-$R^2$ | 0.6561281 |
| UDF – BOŚ S.A. | 0.25502 | 1.05065 | 0.240 | 0.808221 | | |
| UDF – BZ WBK | 1.60222 | 2488.57915 | 0.001 | 0.999486 | | |
| Value of the JESSICA project (log) | 0.87224 | 0.24886 | 3.505 | 0.000457 *** | | |

Significance levels: '.' statistically significant at the p<0.10 level; * statistically significant at the p<0.05 level; ** statistically significant at the p<0.01 level, *** statistically significant at the p<0.001 level. Null deviance: 202.57 on 160 degrees of freedom. Residual deviance: 100.45 on 150 degrees of freedom. Number of Fisher Scoring iterations: 17. The goodness of fit for the logistic regression model was assessed based on the Nagelkerke's R squared. Source: own study.

After fitting the logistic regression model to a set of data, it is also reasonable to verify how well the proposed model fits the observed data. We used the Nagelkerke pseudo-$R^2$ to assess the goodness of fit for our model. The level of pseudo-R2 coefficient amounts to 65.61% which represents a very good fit. The same conclusion can be drawn with regard to the comparison of differences between the null deviance and our model deviance. As

highlighted in notes under Table 4, the value of the residual deviance is twice lower than the null deviance which points to a very good fit as well.

The results of ANOVA are presented in Table 5. These results are consistent with those of the logistic regression, i.e. they indicate that the projects implemented by companies and possessing a high value are significantly associated with capacities to generate revenues. The last column of this table shows a relative importance (contribution percentages) from all possible orderings of the predictors. It can be seen that *value of the JESSICA project* being slightly ahead of *company status* are the most important factors influencing the project capacity to generate revenues.

**Table 5. Results of ANOVA for the JESSICA projects implemented in Poland**

| Term | Statistic | df | p.value | p |
|---|---|---|---|---|
| Type of the beneficiary | 0.937036711 | 1 | 0.333041 | 2.618790 |
| Company status | 15.102779060 | 1 | 0.000102 *** | 42.208605 |
| LGA status | 0.570658147 | 1 | 0.449998 | 1.594851 |
| Regions | 3.766258716 | 4 | 0.438562 | 10.525780 |
| UDF | 0.058653823 | 2 | 0.971099 | 0.163923 |
| Value of the JESSICA project (log) | 15.345893520 | 1 | 8.95E-05 *** | 42.888051 |

Significance levels: *** statistically significant at the p<0.001 level.
Source: own study.

In short, the empirical analyses undertaken here suggest that the most desirable projects from the JESSICA perspectives are those of the high total value and implemented by companies. These types of projects are characterised by relatively large capacities to generate revenues resulting from their primary business activities. Moreover, many of them, mostly done by private entities, demonstrate strong capabilities to achieve fair commercial return on investment. This means that those projects not only ensure the repayment of the JESSICA loan by their own but also were able to overcome market failures through introducing or restoring market activities in deprived urban areas.

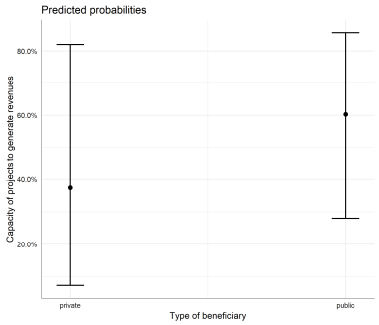
## CONCLUSIONS

This article provides empirical evidence of the JESSICA initiative in five Polish regions showing key information about its institutional frameworks and urban projects implemented with the use of the repayable funds. In particular, it investigates what factors influence the capacities of JESSICA projects to generate revenues on their own and identifies the factors that have the most significant impact on the viability of projects and their high self-financing level.

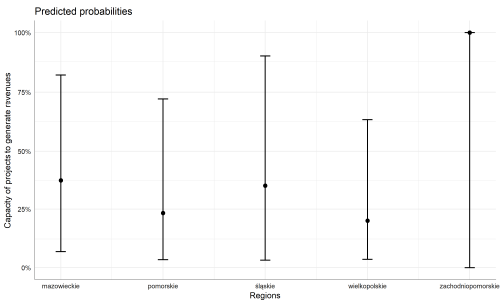
The general results of the analysis suggest that every third project executed mainly by public entities do not provide any revenues. Further, slightly more than a half of all beneficiaries classified as public entities run non-revenue generating projects. Promoters of these projects had to cover their own repayment needs from other sources than sales revenues which, in turn, reduces notably the repayable nature of JESSICA financing. In addition, it is surprising that one in four projects implemented by private entities is marked by the lack of operating revenues as well. Those projects consists in particular in modernisation or improvement of physical and technical characteristics of residential infrastructure, and their

main 'net value added' is created basically as a result of the reduction of operational costs due to savings engendered by the rise of energy efficiency.

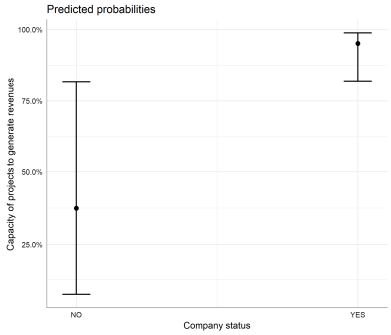
Interesting insights come from the analysis of factors affecting the capacities of JESSICA projects to generate revenues based on own resources. The empirical results can be summarised as follows. First, the strong statistically significant association between the company status and the capacity of projects to generate revenues points to that the capacity of projects to generate revenues is higher when they are implemented by companies. Second,



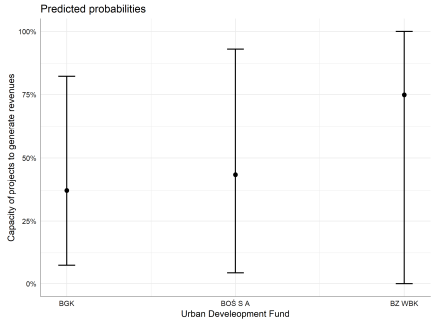

**a) interaction effect of the type of beneficiary on the project capacity to generate revenues**



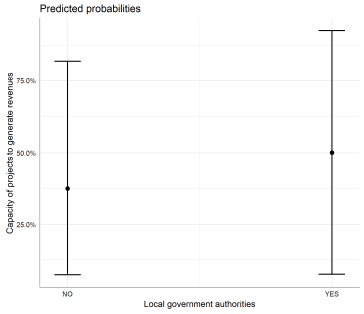

**b) interaction effect of the regions on the project capacity to generate revenues**



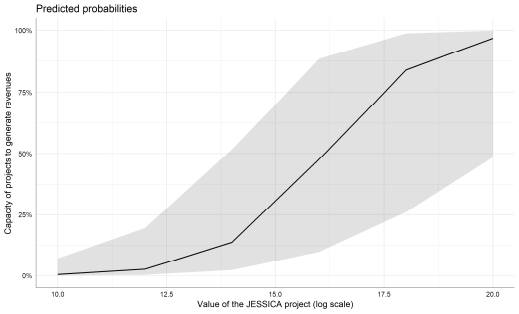

**c) interaction effect of the company status on the project capacity to generate revenues**




**d) interaction effect of UDF on the project capacity to generate revenues**




**e) interaction effect of LGA on the project capacity to generate revenues**




**f) interaction plot of the value of the JESSICA project on the project capacity to generate revenues**

**Figure 2. Effect display for the predictors of the project capacity to generate revenues**
Source: own elaboration.

the capacity of projects to generate revenues increases with the growing value of JESSICA projects. A parallel can be drawn here with the amount of the JESSICA loan which is due to strong correlations between both variables. Thus, findings emerging from the empirical analysis suggest that the most appropriate projects to be considered for JESSICA support are those of a high value and implemented by companies. Those kinds of projects covering often diversified business activities and offering a comprehensive range of services or goods are able not only to generate profits and ensure the repayment of the loan based on self-financing capacity, but also they can provide, at the same time, positive externalities for the local citizens in line with the integrated urban development plans.

Another finding from the article confirms that, despite differentiation and dissimilarity of the approach of regions to the implementation of the projects in terms of the value of the JESSICA loan and their scope, location understood as capital city/ non-capital city relation is insignificant. Furthermore, it should also be stressed that only few authors have dealt with the importance of JESSICA for the transformation of urban areas, focusing at the same time mainly on qualitative research (see e.g. Dąbrowski, 2014, 2015; Fotino, 2014; Musiałkowska & Idczak, 2018b; Tarnawska & Rosiek, 2015) or examining its institutional framework (Bode, 2015; Nadler & Nadler, 2018). Our study provides, for the first time, empirical evidence on all projects implemented in Poland with the use of JESSICA funds and on this basis those findings have a more profound effect on the knowledge of JESSICA initiative compared to previous results reported in the literature.

It can be concluded that a clear policy implication follows from the findings of our article. The projects characterised by a high value and proposed by entities having the company status involve private capital and consequently do generate capital backflows. In this sense, they contribute to the leverage effects and thereby raise the role of JESSICA as a powerful instrument aimed at rendering existing market failures. However, this analysis can become more sophisticated if leverage effects are measured. Indeed, more research is necessary to resolve this limitation of the study. Nevertheless, these results can be considered to be an important contribution to the debate on the potential solutions concerning the implementation of the JESSICA initiative in the current and next financial period.

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## Authors

The contribution of co-authors is diversified and can be expressed as 55% Piotr Idczak and 45% Ida Musiałkowska.

**Ida Musiałkowska**

Associate Professor at Department of European Studies, Poznań University of Economics and Business (Poznań, Poland). Her research interests are dynamics of regional integration and development processes in the EU and world, EU cohesion policy, European integration, Latin American integration, regional business cycles and policy transfer.

**Correspondence to:** Dr hab. Ida Musiałkowska, prof. UEP, Poznań University of Economics and Business, Department of European Studies, al. Niepodległości 10, 61-875 Poznań, Poland; +48 61 854 33 09; e-mail: ida.musialkowska@ue.poznan.pl

**ORCID** http://orcid.org/0000-0002-7054-7648

**Piotr Idczak**

Assistant Professor at Department of European Studies, Poznan University of Economics and Business (Poznań, Poland). His primary research interests encompass European integration, regional economic development with particular focus on the development of peripheral regions, urban regeneration, and the evaluation and analysis of financial engineering instruments used in the EU cohesion policy.

**Correspondence to:** Dr Piotr Idczak, Poznan University of Economics and Business, Department of European Studies, al. Niepodległości 10, 61-875 Poznań, Poland; + 48 61 854 33 06; e-mail: piotr.idczak@ue.poznan.pl

**ORCID** http://orcid.org/0000-0002-3754-8956

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# Factors Influencing Foreign Direct Investment Flows into Turkey

**Ayla Oğuş Binatlı, Niloufer Sohrabji**

**ABSTRACT**

**Objective:** Foreign direct investment (FDI) is an important determinant of development. Thus, identifying the main drivers of investment is critical especially for emerging markets. The main aim of the article is to verify factors influencing FDI flows into Turkey.

**Research Design & Methods:** Foreign investment can be affected by structural factors, such as growth and trade openness; stability factors, such as high fiscal deficits, inflation, and exchange rate changes; and global factors, such as the EU accession and the level of global liquidity. We examine the importance of these variables in affecting FDI flows into Turkey using quarterly data from 1992 to 2010 and cointegration and VECM methodology.

**Findings:** We conclude that for Turkey (and perhaps other emerging markets) structural reforms that expand market size and trade opportunities yield more capital inflows than economic stabilisation efforts that address prices, exchange rates, and budget balances. Moreover, we find that during that period in Turkey, trade and investment were substitutes.

**Implications & Recommendations:** Stabilisation efforts to control prices, exchange rates, and budgets matter, but not as much as structural reforms that impact market potential and trade flows.

**Contribution & Value Added:** Previous literature generally finds that FDI and trade are complements in emerging countries. This was the case in Turkey as well in the eighties and early nineties. We show that the EU candidacy prospects have transformed the relationship between FDI and trade in Turkey.

**Article type:** research article

**Keywords:** Cointegration; VECM; EU accession; FDI; Global liquidity

**JEL codes:** F32, F41, F43

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## INTRODUCTION

This article focuses on foreign direct investment flows in Turkey. On the basis of the prior research we examine the role of structural factors (market size and trade) and stability factors (inflation, exchange rates, and fiscal balances) in promoting FDI flows into Turkey during the 1990s and 2000s. Our focus on Turkey during those two decades is important for several reasons. There was an increasing reliance on capital flows as a driver of Turkey's growth in those decades (İzmen & Yılmaz, 2009). In turn, foreign investment was affected by economic events and policy changes during those decades. The financial crises of 1994 and 2001 probably reduced capital flows. On the other hand, those events were the catalyst to trade liberalisation which can promote FDI inflows. Also, Turkey shifted from a fixed to a floating exchange rate regime, which increased the volatility of the Turkish lira and led to rising trade and current account deficits (Dağdeviren, Oğuş Binatlı, & Sohrabji, 2012). This instability can reduce capital flows.

Aside from the above, two other factors affected FDI flows into Turkey in that period, Turkey's negotiations for the EU accession and the availability of global liquidity. There is empirical evidence that suggests that the EU accession could promote FDI flows. FDI flows have increased due to the EU membership (Buch *et al*., 2003) and the European Monetary Union participation (Schiavo, 2007; Aristotelous & Fountas, 2012). Bevan and Estrin (2004) show that FDI flows into transition countries, whose accession prospects are enhanced, increase even after controlling for proximity and labour cost. However, MacDermott (2007) finds that NAFTA negotiations did not increase FDI to the negotiating countries. We add to this literature by incorporating the impact of the EU accession negotiations beginning in the mid-2000s on FDI flows in Turkey.

Another important aspect of our sample period is the availability of global liquidity which was not incorporated in earlier studies. Rüffer and Stracca (2006) and others compute liquidity as the ratio of nominal money to nominal GDP. Using this measure, Belke, Orth and Setzer (2008) show that the 1990s were a period of low liquidity while the 2000s are a period of high liquidity. Our focus on this period, therefore, enables us to capture the impact of this external factor on FDI in Turkey.

We end our empirical analysis in 2010 because of the significant economic and political changes in Turkey[1] as well as changes in the global environment (rising protectionism) and Europe (Euro crisis).

The article is organised as follows: the next section examines the discussed background of foreign investment in Turkey over the last two decades. Then we present the methodology which is followed by a discussion of results. The last section concludes.

[1] As of 2010, Turkey's political and social environment started changing. In 2010 Turkey had a controversial referendum after which the government gradually became more autocratic, which became faster following the September 2011 elections (Somer, 2016). Widespread street protests took place against the government in the summer of 2013 which became known as the Gezi Park Protests (Yardımcı-Geyikçi, 2014). In June 2015, another controversial election took place and the following year, Turkey witnessed the worst terrorist attacks in its history, with several bomb attacks in the following year (Güneyli *et al*., 2017). Then, in July 2016, there was a failed coup attempt (Esen & Gümüşçü, 2017) after which a state of emergency was declared.

## LITERATURE REVIEW

Foreign direct investment (FDI) can promote growth through technology spillovers (Johnson, 2006; Keller & Yeaple, 2009), export promotion, and improved economic stability through increased savings and better fiscal positions (Kumar, 2007). However, there is a debate about the benefits of FDI for growth.

Hanson (2001) questions the productivity benefits of FDI while Johnson (2006) finds that the benefits of FDI do not extend to all countries. Moreover, Tian, Lo and Song (2015) warn that FDI can have positive and negative spillovers. Also, Sunny (2015) finds that FDI can crowd out domestic investment. Finally, Arslan and Oğuş Binatlı (2010), as well as Wijeweera, Villano and Dollery (2010) argue that FDI is effective only if there is skilled labour, lower corruption levels, and improved infrastructure.

There is also considerable empirical evidence that FDI can help in growth. Arslan and Oğuş Binatlı (2010) find a positive impact of FDI on growth for a sample of 53 countries as Rachdi and Saidi (2011) do for 100 developed and developing countries. Kisswani, Kein and Shetty (2015) show that FDI helps growth in Estonia and Damooei and Tavakoli (2006) find a small positive impact of FDI on growth in Thailand and the Philippines. Omelańczuk (2013) finds that the interrelationship between exports and FDI can promote growth in Poland. There is also evidence of a beneficial impact of FDI on Turkey's growth (İzmen & Yılmaz, 2009).

Given the potential benefits of FDI, it is important to identify drivers of FDI inflows. The structural determinants are market size or growth (Nonnenberg & Mendonça, 2004; Choong & Lam, 2010; Ucal *et al*., 2010; Abbas & Mosallay, 2016) and trade openness (Helpman, 1984; Hummels, Ishii, & Yi, 2001; Nonnenberg & Mendonça, 2004; Kapuria-Foreman, 2007; Choong & Lam, 2010). Stability factors include sustainable budget deficits as well as stable exchange rates and inflation (Nonnenberg & Mendonça, 2004; Erdal & Tatoğlu, 2002). Of the above, the only ambiguous factor is openness, which is typically expected to promote FDI but may reduce FDI if trade and investment were substitutes and FDI was a response to trade restrictions. The determinants of FDI have also been investigated in Turkey. Bilgili, Tülüce and Doğan (2012) find a negative relationship between imports and FDI and a positive relationship between exports and FDI. Erdal and Tatoğlu (2002), as well as Dumludag (2009) highlight the role of market size, openness, infrastructure and economic stability in attracting FDI flows into Turkey.

FDI flows in Turkey were very low for most of the 1990s (Figure 1). However, the 2000s had much higher levels of foreign investment, especially since 2004 (Figure 1). Sayek (2007) notes that Turkey's share in the world FDI flows was less than 0.3% for the 1990s, which increased in the following decade reaching 1% in 2005. The increase in FDI flows from 2006 to 2008 is particularly remarkable reaching approximately 20 billion USD annually, before declining in 2009-2010 due to the global financial crisis (Figure 1).

The target sectors for this increased FDI flows are shown in Figure 2. Financial and insurance activities were consistently an important target sector in that period. Other sectors received substantial investments in some but not in other years. In 2005 and 2006, information and communication services received a large amount of FDI and in 2009 and 2010 electricity, gas, steam and air-conditioning supply was the target of the largest FDI investment. The manufacturing sector received consistent but smaller levels of FDI.

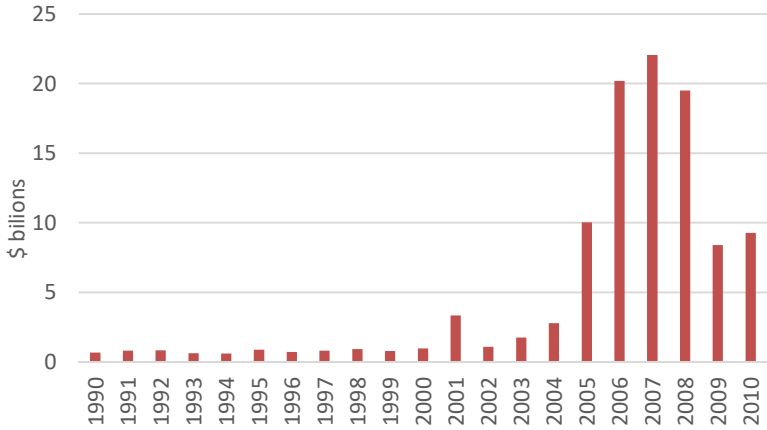


**Figure 1. FDI flows into Turkey 1990-2010**
Source: Central Bank of Turkey.

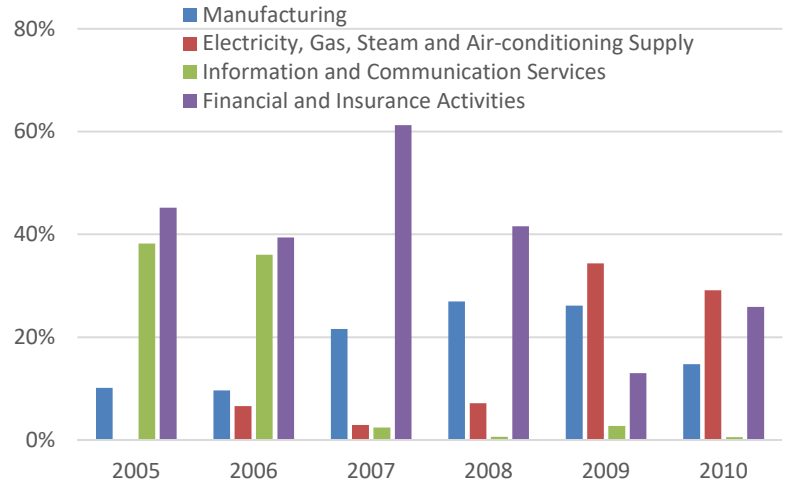


**Figure 2. Sectoral Composition of FDI Flows into Turkey 2005-2010**
Source: Central Bank of Turkey.

Since 2005, FDI inflows into Turkey mainly originate in Europe (Figure 3). Within Europe, the major origin countries are Germany, Austria, Belgium, France, the Netherlands, the United Kingdom and Greece. Greece and Belgium have been the source of large but sporadic FDI; whereas Germany, the Netherlands and Austria, the three countries where most of the Turkish diaspora reside, are the source of smaller but steady FDI.

Our focus is on the determinants of FDI flows into Turkey in the 1990s and 2000s. Table 1 shows that the average annual FDI flows were below 1 billion USD in the 1990s

and were significantly higher by approximately 10 billion USD in the 2000s. Global factors such as the EU accession and the availability of global liquidity can explain why FDI flows were higher in the 2000s. We also examine other factors that can shed further light on FDI inflows in those two decades.

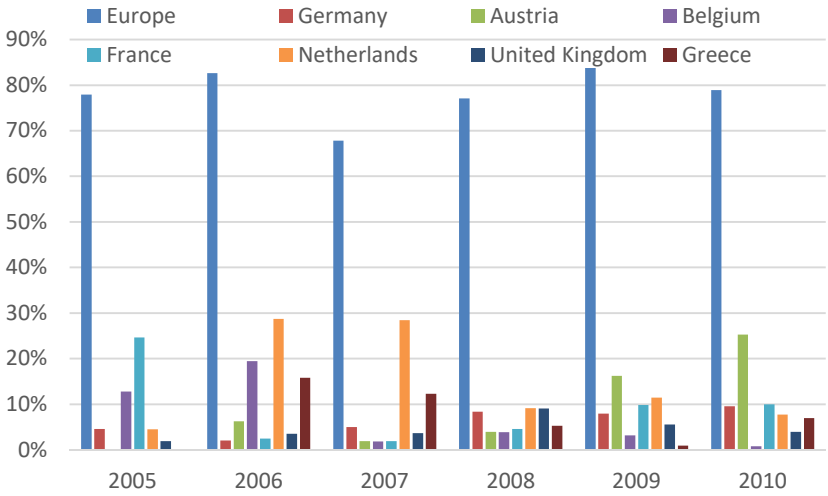


**Figure 3. FDI Inflows into Turkey by Region 2005-2010**
Source: Central Bank of Turkey.

We start with structural factors, growth and trade. At 4%, the annual average real GDP growth during both decades was healthy, but masks economic turmoil caused by financial crises (including the 2008 global crisis). The trading environment also changed. Until the 1980s, Turkey was a fairly closed economy, it pursued a more liberalised trade regime at the end of the decade, which led to increased trade (Nas & Odekon, 1996). Average annual exports and imports in the 1990s were approximately 37 billion USD and 40 billion USD, respectively, which exploded to 111 billion USD and 128 billion USD in the 2000s (Table 1). Rapidly rising trade with a consistently higher level of imports led to high and unsustainable current account deficits which have been linked to the 1994 and 2001 Turkish financial crises (Oğuş Binatlı, & Sohrabji, 2008) affecting both decades.

Other factors that impacted FDI flows were stability factors such as rising fiscal deficits, exchange rate appreciation, and high inflation rates. The average fiscal deficit to GDP ratio for the 1990s was 5.06% and it rose to 5.44% in the 2000s (Table 1). The high average fiscal deficit to GDP ratios in the 2000s was due to the very high levels in the early 2000s following the crisis. The ratio exceeded 16% in 2001 and stayed high for a few more years. The end of the decade saw an improved fiscal deficit position with fiscal deficits falling below 1% of GDP from 2006 to 2009 (although it rose to 1.4% in 2010). Thus, despite the higher average annual fiscal deficit to GDP ratio in the 2000s, we find that that period was in a better fiscal position compared with the 1990s.

The annual real exchange rate appreciation was 3% on average in both decades (Table 1). This data includes severe depreciation related to the 1994 and 2001 crises. There

were also significant depreciations in 2006 and 2008 indicating increased volatility in the 2000s, which was expected given the shift to a floating exchange rate regime following the 2001 crisis. Inflation was very high in the 1990s with an average annual inflation rate of 77% (Table 1). By the 2000s, this figure had dropped to less than 19% (Table 1). This improved position is all the more impressive, given the very high inflation rates following the 2001 crisis, which lessened significantly after 2004.

**Table 1. Statistics on foreign investment and its determinants**

| Factors | 1990-2000 annual average | 2001-2010 annual average |
|---|---|---|
| FDI | USD 0.79 billion | US 9.84 billion |
| **Structural factors** | | |
| GDP growth | 3.89%* | 3.98% |
| Exports | USD 36.86 billion | USD 110.91 billion |
| Imports | USD 40.32 billion | USD 127.92 billion |
| **Stability factors** | | |
| Budget balance/GDP ratio | -5.06% | -5.44% |
| Inflation | 76.78% | 18.44% |
| Exchange rate appreciation | 2.97% | 3.33% |

*Notes: Annual data from 1990 to 2010 is used. * since the measurement of GDP changed in 1998, we leave out the growth rate for 1998*
Source: Central Bank of Turkey.

In some ways, the 2000s were a more dynamic and stable environment. The country was more open to trade, the EU accession was underway, and inflation was lower in the 2000s compared with the previous decade. However, the trade deficit position was more volatile and the decade witnessed Turkey experiencing two significant crises. So, why did Turkey see rising FDI flows? We analyse this question using the methodological framework described in the next section.

## MATERIAL AND METHODS

Based on the theoretical and empirical literature discussed earlier, we examine the structural, stability, and global determinants of FDI flows. Structural factors include economic growth and openness. Growth, which is a proxy for market size, makes a country more attractive for foreign investment. An open trading climate has an ambiguous impact on investment depending on whether the investment is seen as a substitute or a complement to trade. If foreign investors are trying to circumvent trade restrictions, a closed economy increases investment flows into the country and vice versa. However, if a foreign investor intends to sell their products elsewhere or needs to purchase intermediate imports to produce their goods, they might find investing in a closed economy less attractive.

Stability factors include indicators that signal a steady economic environment to foreign investors. An unstable environment such as one with high inflationary pressures or fiscal unsustainability (high fiscal deficits or debt) is a less attractive investment climate. Moreover, if the currency is volatile or significantly overvalued, which could lead to high and unsustainable trade and current account deficits, investors would be wary, leading to reduced capital flows.

Finally, there are global factors including Turkey's progress on the EU candidacy and the overall global liquidity environment. The EU accession prospects are expected to have a positive and statistically significant impact on FDI flows as do periods of high global liquidity (the 2000s, based on the findings of Belke *et al*., (2008).

Based on the above, the determinants of FDI are market size, openness, exchange rate, inflation, deficit, the EU accession, and the availability of global liquidity. Aside from the two global factors, all the other factors affect foreign direct investment and are in turn impacted by them. Thus, estimation would require a vector autoregression (VAR) approach. The structural and stability factors are part of the VAR system, the global factors are treated as exogenous.

The 6-variable vector autoregression with p-lags, denoted as VAR(p), with exogenous variables is expressed as follows:

$$y_t = \eta + \sum_{i=1}^{p} \Gamma_i \, y_{t-i} + \Theta x_t + \epsilon_t \qquad (1)$$

where $y_t$ is a 6 x 1 vector of system variables (FDI, market size, openness, exchange rate, inflation, deficit) each with p-lags, $\eta$ is a 6 x 1 vector of intercept coefficients, and $x_t$ is a 2 x 1 vector of exogenous variables (EU accession and availability of global liquidity). $\Gamma_i$'s are the 6 x 6 coefficient matrices for the system variables and $\Theta$ is the 6 x 2 coefficient matrix for the exogenous variables.

The first step is to test for non-stationarity as a standard VAR in levels cannot be used if the variables have unit roots. We employ ADF and KPSS tests. If variables are non-stationary, the analysis should search for a cointegrating relationship among FDI and its determinants. There are two main approaches to cointegration analysis. The Engle-Granger method is a single-equation method valid only if a single cointegrating vector exists. The Johansen (1988) approach, which estimates a vector error correction model (VECM), can handle multiple cointegrating vectors and will find a cointegrating relationship more reliably if it exists. Thus, following Erdal and Tatoğlu (2002), we use the Johansen cointegration method to identify the main drivers of foreign direct investment in Turkey and estimate a VECM which provides the long-run and short-run relationship between the variables. Lag length for the test is determined by AIC.

Estimation results are analysed in the following section.

## RESULTS AND DISCUSSION

We use quarterly data from 1992 to 2010 to estimate the factors that affect foreign investment in Turkey. **FDI** is measured as billions of U.S. dollars of net FDI inflows (denoted as *FDI*). To capture **market size**, we use the index of industrial production (denoted as *IIP*) rather than GDP. This is a good proxy for two reasons. Firstly, GDP estimation changed in Turkey in 1998, which makes this series problematic. Also, IIP captures the productive capability of a country and is thus an important indicator for investors looking to invest in Turkey. The factor **openness** is included as the sum of exports and imports also measured in billions of U.S. dollars (denoted as *Trade*). For **inflation,** we use the consumer price index (denoted as *Prices*) and for the exchange rate, we use the IMF-estimated CPI-based real effective exchange rate index weighted for Turkey's major trading partners (denoted as *REER*). **Fiscal balance** (denoted as *Budget*) is expressed in thousands of Turkish lira which is converted to billions of U.S. dollars using the lira-dollar market exchange rate. The base

year is 2005 for all the indices. All variables except *Budget* are in natural logarithm terms. We used data from the Central Bank of Turkey website.

In addition to the above, we have two dummy variables for the EU accession and the level of global liquidity. For global liquidity (*GL*) we use a dummy variable that captures the measures identified by Baks and Kramer's (1999) and estimated by Belke *et al*. (2008). They conclude that the 1990s were a less-liquid and the 2000s a more-liquid global environment. Thus, our variable takes a value of 0 for the 1990s and 1 for the 2000s. We also use a dummy variable for the EU accession (denoted as *EU*) which takes a value of 1 for periods following the start of the accession negotiation talks which began in 2005 and 0 for earlier periods. Table 2 presents the variables and their descriptions.

Unit root tests are conducted for all the series except the two dummy variables using ADF and KPSS tests and are presented in Table 3. Tests were conducted assuming a constant and a constant and a trend. The variables are non-stationary in levels and stationary in first differences.

**Table 2. Description of variables**

| Variables | Description |
|---|---|
| *FDI* | Foreign direct investment flows in billions of U.S. dollars |
| *IIP* | Index of Industrial Production (base year = 2005) which is a proxy for market size. |
| *Trade* | Exports and imports in billions of U.S. dollars |
| *Prices* | Consumer Price Index (base year = 2005) |
| *REER* | IMF estimated CPI-based real effective exchange rate index weighted for Turkey's major trade partners (base year = 2005) |
| *Budget* | Fiscal balance expressed in Turkish lira converted to billions of U.S. dollars using market exchange rate. |
| *EU* | Dummy variable equal to 1 after the EU accession talks began in 2005. |
| *GL* | Dummy variable equal to 1 after 2000, which is considered a period of high global liquidity. |

Notes: all variables except Budget, EU, and GL are in natural logarithm terms.
Source: Central Bank of Turkey.

Given this result, we test for cointegration between the variables including exogenous variables described above. The results of the Johansen eigenvalue test shows evidence of one cointegrating relation between the variables[2].

Results of the VECM estimation are presented in Table 4. We start with the long-run coefficients. Theoretically, *Trade* had an ambiguous relation with FDI. We find a negative relationship which indicates that in the long run, foreign investment and trade are substitutes. However, there is literature that suggests that FDI and trade are complements, such as a study by Zysk and Śmiech (2014) on Visegrad countries and by Erdal and Tatoğlu (2002) on Turkey. Martens (2008) reviews the relationship between FDI and trade and concludes that there is enough evidence to show that trade and FDI are complements in emerging countries in most cases, but there are some exceptions, for example, Brazil or OECD FDI to Africa. Also, Kreinin and Plummer (2008) find that trade and FDI act as substitutes in the cases of regional integration. Thus, our finding suggests

[2] The eigenvalue statistics are 41.74 and 31.72 for the null of no cointegrating relation and at least one cointegrating relation, respectively

that the previous complementarity between FDI and trade in Turkey (Erdal & Tatoğlu, 2002), may have been transformed due to integration prospects.

**Table 3. Unit Root Test Results**

| Factors | ADF[a] | | KPSS[b] | |
|---|---|---|---|---|
| | μ | μ,τ | μ | μ,τ |
| *FDI* | -1.29 [1] | -2.93 [1] | 0.92* (6) | 0.16* (6) |
| Δ *FDI* | -15.04* [0] | -14.92* [0] | 0.04 (1) | 0.04 (1) |
| *IIP* | -0.74 [6] | -2.51 [5] | 1.07* (6) | 0.07 (5) |
| Δ *IIP* | -4.90* [5] | -4.84* [5] | 0.15 (17) | - |
| *Trade* | 0.36 [6] | -1.57 [6] | 1.05* (6) | 0.13** (6) |
| Δ *Trade* | -4.59* [5] | -4.56* [5] | 0.45 (51) | 0.08 (6) |
| *Prices* | -4.26* [2] | -0.68 [0] | 1.07* (6) | 0.29* (6) |
| *Δ Prices* | - | -6.61* [0] | 0.97* (6) | 0.15* (6) |
| *REER* | -1.34 [0] | -3.42** [2] | 1.00* (6) | 0.11 (5) |
| Δ *REER* | -5.75* [3] | - | 0.14 (8) | - |
| *Budget* | -2.18 [5] | -2.20 [4] | 0.37** (2) | 0.35* (2) |
| Δ *Budget* | -4.77* [3] | -4.73* [3] | 0.10 (14) | 0.09 (14) |

Notes: all tests are conducted for a constant (μ) and a constant and trend (μ,τ). * and ** denotes rejection of the null at 5% and 10% level of significance respectively. The null for ADF is that the variable is nonstationary and for KPSS is that the variable is stationary. [a] Lag length (in square brackets) is selected based on AIC with maximum lag length set at 6. [b] Bandwidth is in brackets.
Source: own study.

*IIP* and *Budget* are positively related to FDI while *Prices* and *REER* are inversely related to FDI. The greater the economic potential of a country (as measured by IIP), the greater the level of FDI. Price increases and budget deficits which signal instability are associated with lower FDI. A higher REER implies an appreciation of the real effective exchange rate and hurts FDI. This result also reaffirms the previous finding about trade and FDI being substitutes. Thus, the long-run relation between FDI and all structural and stability indicators has expected results and is statistically significant.

In the short run, only three factors have a statistically significant impact on FDI. Once again, market size has a positive effect and prices have a negative effect on FDI. Unlike in the long run, trade and FDI are complements in the short run. The positive impact of openness on FDI reinforces the findings of Erdal and Tatoğlu (2002) and Güngör and Oğuş Binatlı (2010). Exchange rate and budget balances do not play a statistically significant role in FDI flows in the short run.

Moving on to our two exogenous variables, *EU* and *GL*, we find that as expected, greater integration with the EU and greater availability of global liquidity lead to greater FDI flows into Turkey. Although, *EU* is not a statistically determinant of FDI at usual levels of significance, the adjusted $R^2$ test shows that it is an important variable in the estimation. This supports the results of Güngör and Oğuş Binatlı (2010) concerning the additional benefits of emerging markets joining economic unions. Moreover, emerging markets, unlike developed countries, cannot escape conditions in the global environment and are more susceptible to the availability of global liquidity.

**Table 4. VECM Results**

| Variable | Coefficient | Standard Error |
|---|---|---|
| ***Long-run coefficients*** | | |
| *IIP* | 13.57* | (2.48) |
| *Trade* | -1.87* | (0.81) |
| *Prices* | -0.62* | (0.15) |
| *REER* | -4.16* | (1.28) |
| *Budget* | 0.03* | (0.01) |
| *EU* | 0.14+ | (0.22) |
| *GL* | 0.62* | (0.29) |
| *Error correction term* | -0.40* | (0.12) |
| ***Short-run coefficients*** | | |
| Δ *FDI* | -0.44* | (0.11) |
| Δ *IIP* | 4.69* | (2.06) |
| Δ *Trade* | 2.19* | (1.06) |
| Δ *Prices* | -2.86** | (1.75) |
| Δ *REER* | 0.51 | (1.07) |
| Δ *Budget* | *-0.001* | *(0.008)* |
| $R^2 = 0.487$ | | |

Notes: Lag length of the underlying VAR was determined to be two lags based on AIC. We report long-run and short-run results, as well as the coefficients for the exogenous factors and the error correction term. We include but do not report the constant term. * and ** indicates that the variables are statistically significant at 5% and 10% level of significance respectively and + indicates that although the variable is not statistically significant at usual levels of significance, the inclusion of the variable is justified when examining adjusted R2.
Source: own study.

Finally, we turn to the error correction term. For long-run equilibrium, this coefficient should be negative and less than the absolute value of 1. We find a coefficient of -0.401, which is a relatively large coefficient that indicates a quicker convergence to long-run equilibrium. We calculate the speed of adjustment following Mathisen (2003) and Dağdeviren *et al.* (2012) as the inverse of this coefficient which shows the number of quarters it would take to eliminate half the deviation from long-run equilibrium. We find that 50% of the deviation in long-run equilibrium is eliminated in less than three quarters.

In addition to the above, we analyse the impulse response function of FDI to a one-unit shock to each of the other endogenous variables in the system (Figure 2). These results are dependent on the order of the underlying VAR system. Based on Wijeweera and Mounter (2008)[3], we use the following order for the VAR: *FDI, IIP, Trade, Prices*, *REER,* and *Budget*. FDI flows respond positively to a unit shock in *IIP*, *Trade*, and *Budget* and negatively to *Prices* and *REER*.

There is a considerable similarity in the magnitude and trajectory of the effects. There is a relatively large initial effect which becomes a smaller sustained impact after the third quarter which stays beyond the two-year period (graphs of longer periods are not shown here). Structural factors (*IIP* and *Trade*) have a bigger impact than the stability factors (*Prices*, *REER*, and *Budget*). Of the two structural factors, openness (*Trade*) is more volatile

[3] Wijeweera and Mounter (2008) have variables not included in our VAR and vice versa. We maintain the theoretical underpinning to the order.

while market capacity (*IIP*) has a bigger effect. Among the stability factors, the exchange rate (*REER*) dominates while inflationary pressures (*Prices*) has the smallest impact.

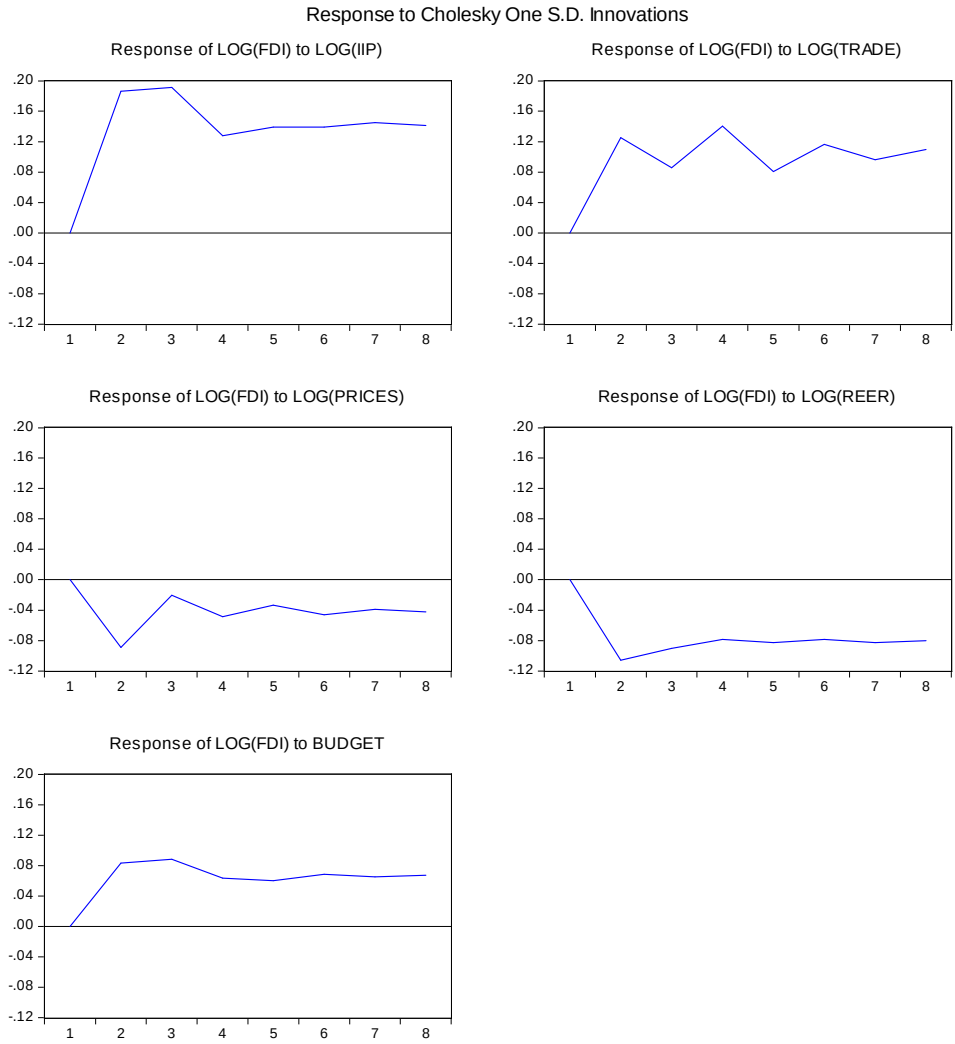


**Figure 2. Impulse Responses of FDI**

Notes: we present impulse responses for FDI for a one-unit shock to other variables in the system. Impulse responses are reported for two years (eight quarters).

Source: own elaboration.

Our empirical analysis shows that structural factors (growth and trade) dominate over all other determinants of FDI. Moreover, our results highlight the complex relationship between trade and FDI which is affected by economic integration. Our finding of the substitutability between FDI and trade in Turkey in the sample period suggests that the complementarity between FDI and trade in earlier decades in Turkey was affected and transformed by the EU candidacy prospects.

## CONCLUSIONS

In this article, we analyse the factors that affect FDI flows into Turkey. Turkey's struggles with economic instability (high prices and deficits) as well as the financial crises which led to the introduction of the new Turkish lira and the change in exchange rate regime have important implications for attracting capital flows. In addition, Turkey's experience with reforms that liberalised the economy in response to earlier crises as well as due to the EU accession make the country an important case study.

Using cointegration and vector error correction methodology we estimate a long-run and a short-run impact of market size and openness (structural factors) and prices, exchange rates, budget balances (stability factors). Structural factors play an important role in the long- and short- run, while stability factors only matter in the long run (except prices which are also important in the short run). The EU accession and the availability of liquidity (global factors) also have an impact on FDI.

The role of trade is important and complex. Trade and foreign investment were complementary in the short run. This means that the reforms that have liberalised Turkey's trade regime helped attract capital flows although the impulse responses show some volatility. A related result is that the period since the EU accession talks began (which increased trade opportunities with the EU common market) saw increased FDI flows. In the long run, however, trade is shown to be a substitute for FDI. This result is striking given that trade continues to be an integral part of Turkey's development strategy. Our results show that short-run and long-run effects of FDI on trade could be different, which might explain some of the mixed results in the literature. On the other hand, a lot of the recent FDI into Turkey was in the services, which may be clouding our results about the impact of trade on FDI and thus needs further research.

What lessons does Turkey offer to other countries? For emerging markets trying to attract capital flows, Turkey provides a useful insight. Our study shows that emerging markets like Turkey are susceptible to global liquidity constraints. Stabilisation efforts to control prices, exchange rates, and budgets matter, but not as much as structural reforms that impact market potential and trade flows. Moreover, it confirms that there are additional benefits for emerging markets that are joining economic unions. It is important to be cautious about the conclusions. While our study shows the importance of these structural, stability, and global factors on FDI flows in general, individual firms may experience the impact very differently. Thus, a micro-based firm-level analysis of FDI inflows would be a useful complement to this study.

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## Authors

The contribution share of authors is equal and amounted to 50% each of them.

**Ayla Oğuş Binatlı**
Bachelor of Arts in Economics (Boğaziçi University, İstanbul, Turkey); PhD in Economics (Boston College, Boston, MA, USA). Her research interests include international economics and environmental economics.
**Correspondence to:** Prof. Ayla Oğuş Binatlı, PhD, İzmir University of Economics, Deptartment of Economics, 156 Sakarya Cad. 35330 Balçova, İzmir, Turkey, e-mail: ayla.ogus@ieu.edu.tr
**ORCID** http://orcid.org/0000-0002-8291-0010

**Niloufer Sohrabji**
Bachelor of Arts in Economics (St. Xavier's College, Mumbai, India); PhD in Economics (Boston College, Boston, MA, USA). Her research interests include international economics and development economics.
**Correspondence to:** Prof. Niloufer Sohrabji, PhD, Simmons University, Department of Economics, 300 Fenway, Boston, MA 02115, USA, e-mail: sohrabji@simmons.edu
**ORCID** http://orcid.org/ 0000-0003-4154-4568

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# Progress of the V4 Countries towards the EU's Energy and Climate Targets in the Context of Energy Security Improvement

**Agnieszka Pach-Gurgul, Marta Ulbrych**

**ABSTRACT**

**Objective:** The aim of this article is to conduct an empirical verification of progress in implementing the provisions of the EU Energy Package and to assess this process in the context of opportunities to boost the energy security of the V4 countries by more efficient energy consumption, using renewable energy and reducing emission of greenhouse gases.

**Research Design & Methods:** The diagnosis is based on the determination of a taxonomic measure using Hellwig's multidimensional comparative analysis method. Then, a linear grouping of objects is used on the basis of changes in the value of indicators in order to prepare a ranking of the EU member states.

**Findings:** Considering all EU member countries, the V4 economies record an average rating in the implementation of the energy and climate framework. Slovakia and Hungary are ranked the highest, Poland and the Czech Republic – the lowest.

**Implications & Recommendations:** The research and discussion might be interesting for policymakers and may have an application value for institutions dealing with energy security and climate policy in the V4 countries.

**Contribution & Value Added:** The study measures progress in the implementation of the energy and climate package in the context of its importance for the energy security of the V4 economies. The work also presents the results of our own research based on taxonomic methods. Using a synthetic variable, a ranking of the EU members and their classification is elaborated according to the level of the indicators studied.

**Article type:** research article

**Keywords:** The EU's Energy Package; energy security; Visegrad group countries

**JEL codes:** K32, Q56

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## INTRODUCTION

The countries of the European Union are striving to diversify the structure of their energy sources by looking for solutions which would be both economically efficient and environmentally friendly. The European Union is undertaking a number of initiatives to promote the modernisation of the energy sector, a fact that is manifested in numerous directives regulating the functioning of the sector. This study focuses on the climate and energy framework adopted in 2008, which comprises a body of binding regulations aimed at carrying out tasks related to climate and energy challenges by 2020. The initiative concentrates on three key objectives, including the reduction of greenhouse gas emissions by 20%, an increase of renewable sources in the EU energy balance by 20%, and a growth of energy efficiency by 20% (20-20-20). The objectives, defined in such a way, are based on the three pillars of the EU energy policy, i.e. energy security, competitive markets, and sustainable development.

This research is focused primarily on the dimension of energy security which, in a long-term perspective, deals with timely investments to supply energy in line with economic developments and sustainable environmental needs (International Energy Agency: IEA, 2019). Hence, rationalising the consumption of energy and improving the energy efficiency of the generation and transmission systems are to provide a guarantee of strengthening the energy security of the European economies (Simanaviciene, Volochovic, & Cibinskiene, 2016). The need to accomplish these tasks is clear in the context of a general downward trend in primary energy production – in 2016, the European Union countries produced 14.7% less energy than a decade before. Decreasing production of primary energy results in a situation where meeting the EU demand increasingly depends on energy imports. This dependence grew from 40% of energy gross consumption in 1990, to 53.6% in 2016 (Eurostat, t2020_rd320). Naturally, the conditions of the member countries in this respect are varied; nevertheless, security of energy supply poses a significant problem for all economies, including the Visegrad Group countries (V4) (Czech, 2017). A study conducted by the Kosciuszko Institute in 2011 contains a comparative analysis of the V4 countries' energy security and indicates that these countries experience similar energy related problems which stem from being dependent on import resources from one direction, apparent diversification, illusory coal-based energy security and the need to significantly reduce $CO_2$ emissions (Kovács *et al.*, 2011). Currently, Slovakia and Hungary, despite a reduction in recent years, are economies whose dependence on energy imports is above average compared to the EU. On the other hand, Poland and the Czech Republic are relatively less dependent, and yet, their dependence is growing.

The adopted energy targets should contribute to making the EU less dependent on energy imports as the consumption of fossil fuels is reduced to limit greenhouse emissions (Siddi, 2016, p. 135) and the share of renewable energy sources is increased (Slaboch & Hálová, 2016). Assuming that the 2020 targets are compatible with an improvement in the V4 economies' energy security, the main aims of the study is to diagnose the degree of 20-20-20 strategy realisation. Moreover, this article is a chance to fill a gap in research into the energy and climate package in the context of its significance for the energy security of the Visegrad Group countries, which gives an innovative character to the current studies.

The grounds for the choice of research problem allowed us to formulate the following hypothesis: a systematic execution of the objectives of the package will allow the V4 countries to increase the level of energy security in their economies by means of rationalising their energy consumption, and also by increasing the share of renewable energy sources in their total energy consumption and by reducing the emission of greenhouse gases. The objective of this article is to evaluate the degree of implementation of the 20-20-20 objectives by the V4 countries, and to assess the possibility of comparing the achievements of these countries in this area. This is meant to result in formulating conclusions with an applicable value for institutions involved in energy security, energy or climate policy in these countries.

In order to rank the implementation of the strategy as adopted in the EU member countries, Hellwig's multivariate analysis method is used. Hellwig's taxonomic development measure synthesises information in a sequence of diagnostic variables and attributes aggregate one measure to the analysed phenomenon. Indicators related to energy use, the share of renewable sources and emissions of greenhouse gases have been considered as key factors to monitoring changes. The research is based on an analysis of the EU source documentation and a statistical study of the analysed phenomena.

The structure of this article is organised as follows: the first section presents a literature review and a development of energy security theory. Then the essence of the energy and climate package in the context of the energy security of the V4 countries is explained. In section 2, the procedure for the selection of diagnostic variables, the taxonomic method and a preliminary analysis of the statistical information collected are presented. In the next, third section, the focus is on a presentation of the empirical results of the study, and subsequently, conclusions and implications are developed.

## LITERATURE REVIEW

In Abraham Maslow's theory of needs, the second level in the fulfilment hierarchy, immediately above physiological needs, is occupied by safety needs. Once these are satisfied, a human being thinks about the fulfilment of higher needs (Mitchell & Moudgill, 1976). In safety typology, energy security is regarded as a very important type of safety, making up an essential constituent of a generally understood safety defined as the national security of a country (Chester, 2010; Dyer & Trombetta, 2013).

The source literature presents a variety of definitions of energy security. This multitude of definitions is continually evolving with regards to the changing character of safety as an entity, condition, process or phenomenon. The literature on the subject contains a debate about both the object and the subject of safety. Safety can be defined with regards to an individual, a local and regional community, a state and the international community. Many researchers, such as Kruyt *et al.*, (2009), Winzer (2012) and Narula and Reddy (2015) agree that no consensus exists around one complete and universal definition of energy security, as it is an equivocal, multifaceted dynamic term. Currently, it is closely connected with the policy of sustainable development, economic factors, the development of energy markets and socio-economic changes in IT technologies or in transport, facts which are clearly stressed in the research by Radovanović, Filipović and Pavlovićc (2017).

The simplest definition refers to energy security as: 'the availability of sufficient supplies at an affordable price' (Yergin, 2006). The constituents of such security comprise: market integration (crude oil, gas, electricity), diversification of resources, safety margin

(e.g. in a form of the reserves of energy raw materials). A detailed definition covers, with its scope, 'the availability of energy at any time, in various forms, in sufficient quantity and at a reasonable price and/or an affordable price' (Månsson *et al.* 2014; Nyga-Łukaszewska & Chilimoniuk-Przeździecka, 2017). Energy security can also be defined as 'the availability of adequate energy at an affordable and reliable price, necessary both from the technological point of view and also from the perspectives of human security' (Wang *et* al., 2018; Sovacool, 2013, Augutis *et al*., 2012).

In practice, energy security concerns many aspects, not only of a strategic and geopolitical character, referring first of all to the effects of the dependence on the import of raw materials and those resources of which an entity is in possession (Chalvatzis & Ioannidis, 2017; Kiriyama & Kajikawa, 2014; Semenenko, 2016; Gunnar Austvik, 2016), but also to other aspects (Dannreuhter, 2017; Jamasb & Pollit, 2008; Xia *et al.,* 2011; Zajączkowska, 2016), namely:

- economic – for a consumer, this means the ability to purchase necessary energy at an affordable price,
- ecological – concerning respect for the natural environment, among other things, by means of the limitation of the use of conventional fuels, which is meant to reduce the emission of $CO_2$, or the use of new environment-friendly technologies, e.g. CCS (carbon capture and storage),
- infrastructural – as the condition of infrastructure, the lack of financing and investments into infrastructure have a direct impact on the energy security of a given country.

According to the IEA, energy security in practice should be perceived as a problem pertaining to risk management, i.e. 'the reduction of risk and consequences of disruptions to an acceptable level' (IEA, 2007). The condition of energy security may be described as the uninterrupted/continual possibility to access energy at an affordable price, taking account, at the same time, of issues related to the protection of the natural environment. The IEA differentiates between energy security in a long-term and short-term context. Energy security in a long-term context is strongly connected with planned or executed investments (into infrastructure in particular) which are meant to facilitate the energy supply, and, at the same time, energy security is strongly correlated with the economic development of a given country and the needs of the natural environment. Short-term energy security, then, in the view of the IEA, is seen as the capability of a prompt reaction of the energy system to sudden changes in energy demand and supply. Such an understanding of energy security is also referred to in various academic publications and research projects (Sovacool *et al*., 2011, Cherp & Jewell, 2011). Thus, it can be observed that a number of research projects emphasise an interdisciplinary approach to energy security (Månsson, 2014; Cipollaro & Lomonaco, 2016; Löschel, Moslener, & Rübbelke, 2010; Kapustová, Kapusta, & Bielik, 2018).

The problem of energy security was treated as a political issue for many years, with lesser significance for the economy of a given country. After the end of WWII, the general accessibility of energy raw materials and their relatively low prices resulted in the fact that the problem of supplying economies with energy was not perceived in strategic terms. Yet, such events as the oil crisis of 1973, the end of the cold war, or the sudden increase in the prices of energy raw materials resulted in a change of approach towards the theory of energy security and heated up the debate on this subject, in particular in the context of crude oil substitutes or the diversification of the methods of its acquisition, which has been observed by Proskuryakova (2011) or Markandya and Pemberton (2010). However, even

so this issue was still not a priority in the policy of the majority of world countries. It was only the record-breaking prices of crude oil in the summer of 2008, the second war in Iraq, the problem of global warming, the world economic crisis and its consequences for the prices of raw materials and for investments in the energy sector that brought the debate on energy security back onto the table. It was then that priority and strategic significance for the functioning of particular states was attributed to the above issue, a fact that is confirmed in the studies by Goldthau (2011), and also Zhou *et al*. (2018).

With the progress of time, the subject of energy security has become essential for the European Union, which is currently the world's largest importer of primary energy, as more than half of the energy consumed in the EU (53.6%) is imported (European Commission, 2018). At the same time, this is an import from a relatively small number of suppliers which implies a potential threat to energy security. The fact that about 30% of each of the key energy carriers today (crude oil, natural gas or coal) imported into the EU, is purchased from Russia (European Commission, 2018) is especially disadvantageous. Unfortunately, this dependence has persisted for many years, a fact which is observed in many research analyses (Costantini *et al*., 2006; Jääskeläinen *et al*., 2018). The breakthrough in the European Union in the perception of energy security came with the gas crises between Russia and Ukraine in January 2006, and in particular, in January 2009. These conflicts delineated the importance of the energy security of the EU and the threats which existed in energy supply and distribution. As a result of the crisis in 2009, gas supply to a total 300 million cubic meters per day was cut off for 14 days, and as a result, in the period between 6th and 20th January, the EU countries were deprived of 20% of their gas, a fact which had grave economic consequences. The loss sustained by the EU countries was estimated to be 1.6 billion EUR (Lee, 2017). Many researchers point out that concerns about energy security began to grow even more in the face of the new political conflict between Russia and Ukraine in 2014 (Van de Graaf & Colgan, 2017; Goldthau & Boersma, 2014).

As a result of the gas crises, the Visegrad Group countries also sustained a lot of harm. Their sense of energy security was strongly shaken. The source literature and academic analyses point to the fact that these countries still have a poorly developed gas pipeline infrastructure in directions other than east-west and they are strongly dependent on the import of Russian gas, which is supplied through Ukraine (Gálová, 2013). These countries experienced significant disturbances in the supply of gas during that period. Only the Czech Republic imported some amount of gas through the system of the German gas supply network, which compensated for the shortages in Russian supplies. All the other countries could only rely on their strategic reserves. The country that suffered the most as a result of the supply cut-off was Slovakia (Muller-Kraenner, 2007). It was for the first time in its history that it was completely cut off from external gas supplies. Poland did not receive 80% of its planned supplies and Hungary 60%.

This is why, over the course of time, the EU leaders have undertaken efforts aimed at the limitation of the dependence on imports of raw materials and at strengthening the energy security of the EU in all other aspects. This is why actions were initiated aimed at a broadly defined diversification of the new suppliers of energy raw materials, such as Canada, the USA or China. At the same time, solutions influencing the EU energy security in many aspects have been sought (Marquina, 2008). This was the context of the preparation of the energy and climate package, not only in this strategic and political aspect, but

also in an economic, ecological and infrastructural one, a fact which is also pointed out in the studies by Skjærseth (2013), Helm, (2014) and also Christa Uusi-Rauva (2010).

## The Essence of the Energy and Climate Package in the Context of the Energy Situation of the Visegrad Group Countries

On 23rd January 2008, the European Commission presented the energy and climate package, which constitutes a collection of objectives and goals which are intended to be achieved by 2020 by the European Union in its energy and climate policy. This Package is known as 3x20% or 20-20-20 by 2020, with its main objectives being:

1. An increase of the share of the energy obtained from renewable sources of energy (RSE) to 20% in the total energy balance of the European Union by 2020.
2. A limitation of the primary energy consumption in the European Union by 20% in comparison with the prognosis made for 2020, and presented in 2005.
3. A reduction of $CO_2$ emission by 20%, in comparison with the level of emissions from 1990.

This undertaking put an obligation on the member states to implement the main Directives in this respect (European Commission, 2012; European Commission, 2013; European Parliament and the Council of the European Union, 2009), and thus to amend their national energy policies, which is by no means an easy task due to the diversity of the energy cultures of these countries, a fact which is pointed out in the research of Stephenson *et al.* (2010), Love, Rupp and Strauss (2013), Tapio *et al.* (2007), and Campbell (2002). The objectives of the energy and climate package have become so significant that they were also confirmed in the 'Europe 2020' Strategy (European Commission, 2010). The literature on this subject shows a dispute as to whether this document really makes any contribution to the energy security of the EU (Henriksen, Hussey, & Holm, 2011), or whether it rather implies unnecessary costs for these countries and should rather be simply amended (McKillop, 2012). The package defines the main objectives for the entire European Union: 3x20% by 2020, consisting of individual objectives concerning the share of renewable energy in their energy mixes and also the reduction of $CO_2$ emission and a decrease in the primary or final energy consumption. These objectives vary between the member states with regards to the diversity of their raw material supplies, their national energy mixes, the energy consumption level of their industries, their GDP per capita, their national energy policy, etc. (Pach-Gurgul, 2016).

The execution of the provisions of the energy and climate package poses a significant challenge for all the EU countries. There are many academic and research papers concerning the execution of the energy and climate package by specific EU member states, such as Germany (Eikeland, 2014) or the Netherlands (Gulbrandsen, Skjærseth, & Birger, 2014), or discussing the subject in the context of their economic growth (Smiech & Papież, 2014). There is, however, no research concerning the execution of the objectives of the energy and climate package by the Visegrad Group countries, which have a very specific energy situation, especially in the context of their energy security which was the main motivation for the Authors of this study to take up this subject.

These countries, after the Second World War, found themselves under the hegemony of the Soviet Union, with very strong connections to that country, resulting from economic treaties and military pacts. The common historic heritage of these countries with centrally

planned economies resulted in the fact that, in spite of the existing differences in the national, ethnic and cultural spheres, their economies were very similar to one another. This fact also had a great influence on their industries and the direction of their development (Ulbrych, 2018). The Central European countries invested in energy-consuming and high-carbon emitting heavy industry, making up a specific energy culture based on the accessibility of cheap energy raw materials – coal, crude oils and natural gas – traded at preferential prices within the soviet bloc (Fitzmaurice, 1998). Cheap raw materials and final energy, treated as a common public good, the provision of which was the responsibility of the state, did not foster energy saving and even contributed to its waste. The use of fossil hydrocarbons in energy production resulted in high carbon emisiveness. All these factors and circumstances contributed to the creation of an energy situation of the Visegrad Group countries completely different from that of other EU countries, and this difference still persists. The most sensitive issue is the dependence of the V4 countries on the import of raw materials from one source only, namely Russia, on account of its geographic closeness, as observed in the studies of Aalto (2016), Smith (2008), Finon and Locatelli (2008).

All these circumstances result in the fact that the extent of the heavy historic heritage of this group of countries renders the execution of the energy and climate package extremely difficult. However, the realisation of this package may indirectly contribute to a positive impact on the level of energy security by means of increasing the share of renewable sources of energy, and thus decreasing the dependence on imported energy raw materials, enlarging their energy efficiency, reducing greenhouse gas emissions; all of which, from the point of view of the protection of the natural environment, makes up an issue of gross significance.

## MATERIAL AND METHODS

The research procedure was subordinated to the adopted hypothesis, which assumes that the systematic implementation of the 20-20-20 requirements will allow the V4 countries to increase the level of energy security of their economies by rationalising energy consumption, increasing the share of renewable energy in total energy consumption and reducing greenhouse gas emissions. Research into climate and energy implementation progress has been carried out for all 28 EU member countries for the years 2005-2016 and the data on which the research was based comes from the Internet databases of the European Statistical Office (Eurostat). For the empirical verification of the degree of achievement of the 20-20-20 objectives by the V4 countries, the method of multivariate comparative analysis was selected, which also allows the possibility of organising objects and comparing the economies analysed with other EU member states. The study is based on the determination of a taxonomic measure using the Hellwig's method, applied to develop the ranking of objects described in a multidimensional space of features, while taking certain ordering criteria into consideration. For the linear ordering of objects described by many diagnostic variables, a synthetic indicator of development is calculated (Gałecka & Smolny, 2018, p. 41).

### Selection of Input Variables and Their Time Course

After the analysis of several methodological approaches and the verification of the suitability and accessibility of statistical data, the Authors decided to base their research on a classical approach, which takes into consideration the following variables:

– in the area of the greenhouse gas emissions reduction by 20%: 'greenhouse gas emissions, base year 1990'. This variable is presented as a percentage in reference to the year 1990 and is negatively correlated with the explained variable, i.e. it is a destimulant;
– in the area of the RSE share increase in the EU energy balance by 20%: 'share of renewable energy in gross final energy consumption'. The feature being analysed has the characteristics of a stimulant;
– in relation to the energy efficiency increase by 20%: 'primary energy consumption'. The EU aims to attain consumption at the level of 1483 million tonnes in 2020, which results from a reduction of consumption by 20% compared with predictions. Therefore, the forecast for 2020 was calculated in relation to 2005, then, the consumption was divided by this forecast and so the objective to be reached is 80%. Thus, an increase in the explanatory variable value leads to a decrease in the explained variable, so it is treated as a destimulant.

| geo\time | 2005 | 2009 | 2016 | TARGET | Distance to the target in p.p. | Distance to the target in % | Yearly savings 2005-2008 | Yearly savings 2009-2016 |
|---|---|---|---|---|---|---|---|---|
| **EU** | 93.56 | 83.98 | 77.64 | 80 | -2.4 | -3.0% | -12.58 | -1.04 |
| **CZ** | 74.47 | 69.49 | 65.62 | 80 | -14.4 | -18.0% | 5.13 | 12.90 |
| **HU** | 81.21 | 69.66 | 65.82 | 80 | -14.2 | -17.7% | 1.13 | 14.16 |
| **PL** | 85.18 | 83.14 | 85.03 | 80 | 5.0 | 6.3% | -7.25 | -4.62 |
| **SK** | 69.27 | 61.36 | 55.63 | 80 | -24.4 | -30.5% | 11.97 | 21.60 |

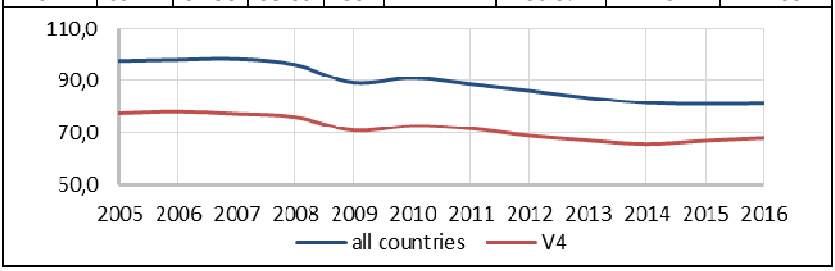


**Figure 1. Greenhouse gas emissions, base year 1990 (%)**
Source: own dataset based on Eurostat. (t2020_30).

Figure 1 presents greenhouse gas emissions in 2005, 2009, and 2016, as these years are important from the perspective of work on the climate and energy framework and its implementation (2005 and 2009); the last year concerns the most recent accessible data. The distance to the set target was calculated on the basis that values with a positive sign indicate what remains in order to achieve the target of 80% of 1990 use. The last two columns refer to the average annual savings in terms of a given feature. In the following years, in two time frames: 2005-2008 and 2009-2016, we calculated losses/savings, and then, the arithmetic mean. Since 2005 three V4 countries (the Czech Republic, Hungary, and Slovakia) have been systematically reducing greenhouse gas emissions from 74.9% to 62.4% of the 1990 level on average, thereby reaching the objective defined in the climate and energy framework. Poland, on the other hand, is still above the objective set due to a negative rate of annual savings in this respect.

| geo\time | 2005 | 2009 | 2016 | TARGET | Distance to the target in p.p. | Distance to the target in % | Yearly savings 2005-2008 | Yearly savings 2009-2016 |
|---|---|---|---|---|---|---|---|---|
| **EU** | 9.0 | 12.4 | 17.0 | 20 | 3.0 | 15.0% | -9.98 | -5.26 |
| **CZ** | 7.1 | 9.9 | 14.9 | 13 | -1.9 | -14.6% | -5.23 | -0.15 |
| **HU** | 6.9 | 11.7 | 14.2 | 13 | -1.2 | -9.2% | -5.13 | 1.16 |
| **PL** | 6.9 | 8.7 | 11.3 | 15 | 3.7 | 24.7% | -7.90 | -4.36 |
| **SK** | 6.4 | 9.4 | 12.0 | 14 | 2.0 | 14.3% | -6.88 | -3.26 |

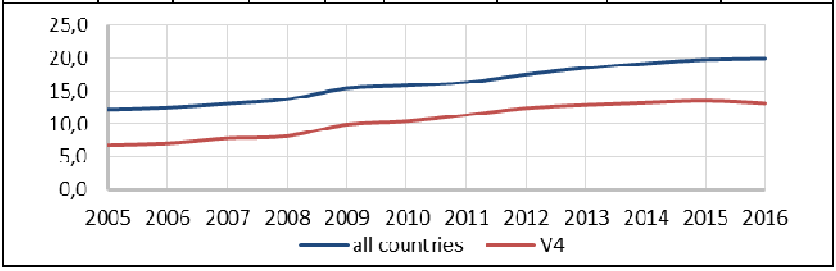


**Figure 2. Share of renewable energy in gross final energy consumption (%)**
Source: own dataset based on Eurostat. (t2020_31).

As far as the share of renewable energy in final energy consumption is concerned, the Czech Republic and Hungary have already exceeded their obligations (Figure 2). The interpretation of the result in reference to the distance of a given country to the adopted objective is analogical to that of Figure 1 – positive values refer to economies which need to improve their results. Poland is the furthest from its target, falling short by 3.7 pp. from reaching 15% of the RSE share. Slovakia is also 2 pp. below the target set at 14% of the consumption of final energy from renewable sources.

In the case of the third feature, describing progress in the area of energy efficiency improvement, the results of the V4 countries are similar to the average for all EU member countries, which suggests a consumption reduction to the level of 80% of use prediction for the year 2020. Analysing these changes in each country individually, we should emphasise that in 2016, Hungary, Poland, and Slovakia achieved better results than those intended by the strategy (Figure 3).

### The Analysis of Diagnostic Variables

In order to analyse the degree of feature value differentiation, a coefficient of variation was used. The degree of diagnostic variable dispersion in reference to all EU countries is above 10%, i.e. the variable is considerably different and statistically significant. Outliers can only be seen for the second variable, but the feature itself is low, and therefore, there is no need to apply the median (Table 1). However, in the case of the V4 economies, the features do not show undue variability, yet, it is high enough for Hellwig's method based on the average.

| geo\time | 2005 | 2009 | 2016 | TARGET | Distance to the target in % | Yearly savings 2005-2008 | Yearly savings 2009-2016 |
|---|---|---|---|---|---|---|---|
| EU | 1713.3 | 1598.9 | 1542.7 | 1483 | 3.2% | -222.70 | -91.04 |
| CZ | 42.5 | 40.3 | 39.9 | 39.6 | 0.6% | -3.52 | -0.98 |
| HU | 25.9 | 23.9 | 23.9 | 24.1 | -0.7% | -1.33 | 0.65 |
| PL | 87.7 | 89.8 | 94.3 | 96.4 | -1.7% | 5.45 | 3.84 |
| SK | 17.8 | 15.6 | 15.5 | 16.4 | -4.4% | -0.83 | 0.60 |

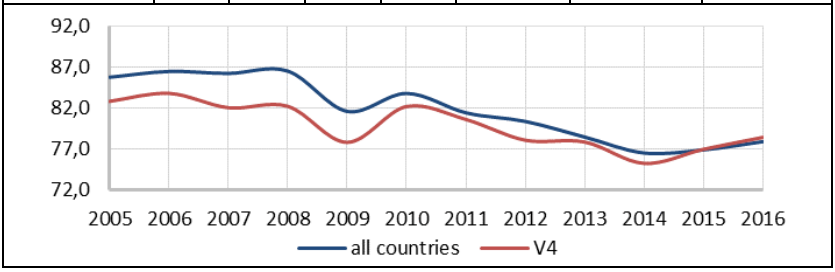


**Figure 3. Primary energy consumption, (Mtoe)**
Source: own dataset based on Eurostat. (t2020_33).

An essential element of this research involves carrying out a multidimensional comparative analysis with the use of Z. Hellwig's taxonomical measure of development. A model was constructed according to the following procedure (Sojka, 2018, pp. 131-132):

- normalisation of diagnostic features on the basis of standardisation in order to fulfil the additive function postulate;
- determination of the pattern for variable stimulants and destimulants;
- after determination of the development pattern, the Euclidean distances between individual units of space and the model object – $d_{i0}$ – were determined;
- calculation of the synthetic variable according to the formula: $q_i = 1 - d_{i0}/d_0$, where $d_0$ is the sum of the arithmetic mean and the double of the standard variable outlier. The synthetic variable falls in the range $[0; 1]$, and $max_i\{q_i\}$ stands for the best object;
- graphic illustration of the countries' positions.

Box plot graphs were used for the comparison of the shape of the data distribution for the aggregate variable. A graphic illustration of the observation dispersion for the cut-off years of the period being analysed is presented in Figure 4.

The length of the rectangle represents the inter-quartile range comprising the middle 50% of observations. It provides information on how the result for a given variable develops around the mean, i.e. it shows the number of lower/higher observations in the studied group than the average for the entire group. The analysis of the data collected in the figure shows that the variable took more different values in 2005 than in 2016, which indicates an improved similarity between some EU economies in the pursuit of the 20-20-20 goal. At the same time, however, there are more outliers in 2016, which results from the length of the 'whiskers'. At the beginning and at the end of the study,

**Table 1. Parameters of diagnostic variables in the years 2005-2016**

| Indicator | Average (a) Coefficient of variation (V) | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Greenhouse gas emissions, base year 1990** | a-all | 97.6 | 98.0 | 98.3 | 96.2 | 89.2 | 91.1 | 88.7 | 86.2 | 83.5 | 81.5 | 81.0 | 81.2 |
| | V-all | 32% | 31% | 31% | 32% | 33% | 31% | 31% | 32% | 30% | 31% | 30% | 31% |
| | a-V4 | 77.5 | 78.1 | 77.3 | 76.1 | 70.9 | 72.6 | 71.6 | 68.9 | 67.2 | 65.7 | 67.0 | 68.0 |
| | V-V4 | 8% | 9% | 10% | 9% | 11% | 12% | 13% | 15% | 16% | 15% | 15% | 16% |
| **Share of renewable energy in gross final energy consumption** | a-all | 12.21 | 12.48 | 13.08 | 13.76 | 15.42 | 15.86 | 16.35 | 17.54 | 18.53 | 19.24 | 19.79 | 19.96 |
| | V-all | 83% | 82% | 78% | 76% | 72% | 68% | 67% | 64% | 62% | 60% | 59% | 58% |
| | a-V4 | 6.8 | 7.1 | 7.8 | 8.2 | 9.9 | 10.4 | 11.4 | 12.4 | 12.9 | 13.2 | 13.5 | 13.1 |
| | V-V4 | 4% | 5% | 8% | 6% | 11% | 14% | 13% | 16% | 18% | 12% | 10% | 11% |
| **Primary energy consumption** | a-all | 85.8 | 86.5 | 86.3 | 86.6 | 81.6 | 83.8 | 81.5 | 80.4 | 78.5 | 76.5 | 76.9 | 77.9 |
| | V-all | 12% | 11% | 11% | 12% | 13% | 11% | 11% | 13% | 12% | 11% | 10% | 10% |
| | a-V4 | 82.9 | 83.8 | 82.1 | 82.2 | 77.8 | 82.2 | 80.6 | 78.1 | 77.9 | 75.3 | 77.0 | 78.5 |
| | V-V4 | 7% | 5% | 6% | 4% | 3% | 3% | 2% | 3% | 4% | 3% | 3% | 2% |

Source: own study.

we can observe right-sided asymmetry (a skewness factor greater than zero), which is characteristic of a set where the majority of countries are doing worse than the average. On the other hand, in the middle years we can observe negative skewness, i.e. left-sided asymmetry, typical of a situation when most countries achieve better results than might be evident from the average for the entire EU.

The next stage of the research involves determining typological groups according to the synthetic measure level. Then, in order to enrich the analysis and address the hypothesis, the forecasts based on data from 2005-2016 is prepared.

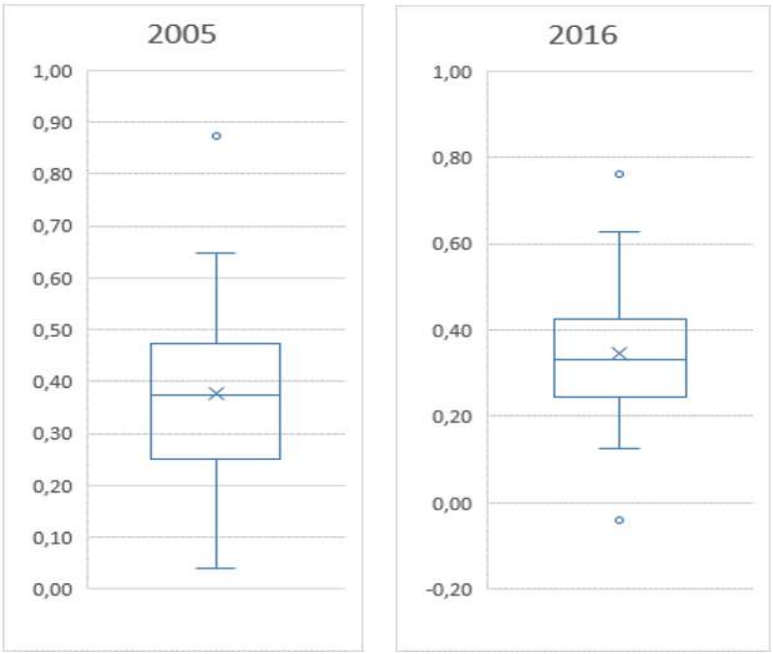


**Figure 4. Distribution of the aggregate variable in 2005 and in 2016**
Source: own study.

## RESULTS AND DISCUSSION

Elaborating the synthetic variable, based on Hellwig's method, for each variable for every analysed country we calculated the distance from the pattern (i.e. from the value most favourable for the given variable – the highest for the stimulants, and the lowest for the destimulant). Then, the distance of a given country from the best country was determined on the basis of all the variables. The synthetic variable is expressed by the formula 1 minus the relative distance of a given country; therefore, the smaller the distance from the pattern, the better. The synthetic variable, based on features describing the progress in achieving the 20-20-20 target, allows us to assess the progress of the V4 economies against the average for all EU countries. Figure 5 presents the course of this variable in the years 2005-2016.

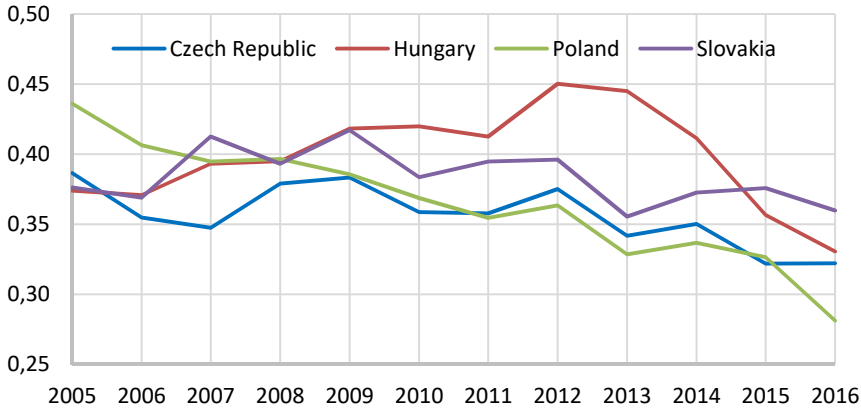


**Figure 5. The value of the synthetic variable of the V4 countries in the years 2005-2016**
Source: own study.

The analysis of the research results does not lead to optimistic conclusions for the V4 Group countries. In all cases, the aggregate measure in 2016 is lower in comparison with 2005. While in the case of Slovakia, Hungary, and the Czech Republic it is small – 0.02, 0.05 and 0.07, respectively, the result for Poland in 2016 was worse by 0.22 than in 2005.

The ranking of countries presented in Table 2 is also useful in determining the V4 countries' position in the EU structure in terms of the phenomenon studied. The countries are listed alphabetically, and their positions in subsequent years are marked in blue or red. The colour intensity is correlated with a given country's position estimated on the basis of the synthetic variable. Therefore, the higher the value of the synthetic variable, the higher the position the country has in the ranking. The objects with the best result are marked with darker blue, the weakest economies are marked with red, and darker red suggests a worse result in the synthetic measure. Latvia, which takes the first place throughout the entire period analysed, is the undisputable leader. Interestingly, it did not have to make much effort because its targets for greenhouse gas emissions had already been achieved at the beginning. In the case of the other two variables, however, the differences were relatively small. Equally, Romania, which improved its result and moved up from the 5th do the 2nd position, occupies a high place in the ranking. A considerable positive change can be noticed in Greece (a difference of 11 positions), Italy (a difference of 9 positions), and Lithuania (a difference of 6 positions). Cyprus, last in the ranking, practically did not manage to reduce gas emissions at all, although it began from a very high level: twice the planned target. The situation with RSE looks much better in this country. In terms of the third variable, there is not much progress either, but at least the target is close. The largest drop, by 9 positions, can be seen in the case of Poland. Germany and France look relatively poor in this context – both countries went down by 5 positions.

In order to illustrate better the changes in the V4 countries' ranks in achieving the 20-20-20 targets, Figure 6 was prepared. Despite a decrease in the synthetic variable value between the years 2005 and 2016, which was presented in Figure 5, Slovakia and Hungary improved their places in the ranking by two positions, which allowed them to become

**Table 2. Countries ranked according to Hellwig's method in the years 2005-2016**

| Country | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | Country |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Belgium | 23 | 22 | 22 | 22 | 25 | 26 | 26 | 23 | 25 | 25 | 24 | 27 | Belgium |
| Bulgaria | 11 | 15 | 14 | 14 | 9 | 10 | 16 | 13 | 8 | 15 | 18 | 14 | Bulgaria |
| Czech Republic | 13 | 14 | 16 | 15 | 14 | 16 | 14 | 16 | 16 | 16 | 15 | 17 | Czech Republic |
| Denmark | 10 | 16 | 13 | 8 | 10 | 14 | 9 | 8 | 9 | 6 | 8 | 7 | Denmark |
| Germany | 16 | 18 | 17 | 17 | 18 | 18 | 17 | 18 | 20 | 20 | 20 | 21 | Germany |
| Estonia | 3 | 3 | 4 | 5 | 3 | 3 | 3 | 4 | 6 | 7 | 6 | 5 | Estonia |
| Ireland | 22 | 23 | 24 | 25 | 24 | 23 | 19 | 20 | 21 | 24 | 25 | 26 | Ireland |
| Greece | 26 | 26 | 26 | 26 | 26 | 22 | 24 | 22 | 17 | 18 | 17 | 15 | Greece |
| Spain | 25 | 24 | 25 | 24 | 21 | 19 | 21 | 21 | 19 | 19 | 22 | 22 | Spain |
| France | 18 | 17 | 18 | 19 | 19 | 20 | 20 | 19 | 23 | 21 | 23 | 23 | France |
| Croatia | 4 | 2 | 5 | 6 | 6 | 4 | 4 | 2 | 3 | 3 | 3 | 3 | Croatia |
| Italy | 19 | 19 | 19 | 18 | 17 | 17 | 18 | 15 | 14 | 12 | 12 | 10 | Italy |
| Cyprus | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 28 | Cyprus |
| Latvia | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | Latvia |
| Lithuania | 12 | 10 | 15 | 16 | 16 | 5 | 5 | 6 | 4 | 4 | 5 | 6 | Lithuania |
| Luxembourg | 20 | 20 | 20 | 20 | 20 | 21 | 23 | 24 | 22 | 22 | 19 | 20 | Luxembourg |
| Hungary | 15 | 11 | 11 | 11 | 11 | 12 | 12 | 10 | 10 | 11 | 13 | 13 | Hungary |
| Malta | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 24 | Malta |
| Netherlands | 21 | 21 | 21 | 21 | 23 | 25 | 25 | 26 | 26 | 26 | 26 | 25 | Netherlands |
| Austria | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 9 | 12 | 10 | 10 | 11 | Austria |
| Poland | 9 | 9 | 10 | 10 | 13 | 15 | 15 | 17 | 18 | 17 | 14 | 18 | Poland |
| Portugal | 17 | 13 | 12 | 9 | 15 | 11 | 10 | 11 | 13 | 13 | 16 | 16 | Portugal |
| Romania | 5 | 4 | 3 | 3 | 4 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | Romania |
| Slovenia | 8 | 8 | 8 | 13 | 8 | 9 | 11 | 12 | 11 | 9 | 9 | 9 | Slovenia |
| Slovakia | 14 | 12 | 9 | 12 | 12 | 13 | 13 | 14 | 15 | 14 | 11 | 12 | Slovakia |
| Finland | 2 | 6 | 6 | 4 | 5 | 6 | 6 | 5 | 5 | 5 | 4 | 4 | Finland |
| Sweden | 6 | 5 | 2 | 2 | 2 | 7 | 7 | 7 | 7 | 8 | 7 | 8 | Sweden |
| United Kingdom | 24 | 25 | 23 | 23 | 22 | 24 | 22 | 25 | 24 | 23 | 21 | 19 | United Kingdom |

Source: own study.

best-classified among the V4 countries. The reverse trend was observed in the other two countries, the Czech Republic ranked 5 positions lower in the general ranking. Poland, meanwhile, dropped from the top to the lowest position in the V4 group.

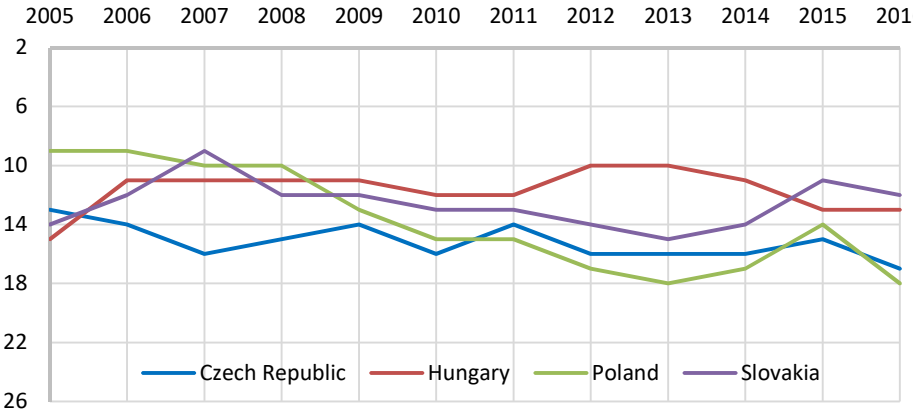


**Figure 6. The positions of the V4 countries in the ranking of achieving the 20-20-20 target in the years 2005-2016**
Source: own study.

During the research, the positions of individual countries were determined, and the result were presented in Figure 7. The group being studied was divided on the basis of quartiles. This grouping provides an idea of where the results of the V4 economies are positioned against the entire group. Eventually, there emerged three groups of countries in terms of the synthetic value:

1. Countries which are the best in achieving the 20-20-20 target;
2. Countries which are average in achieving the 20-20-20 target;
3. Countries which are the poorest in achieving the 20-20-20 target.

In the period being analysed, the V4 economies are in the second group, i.e. the countries with average results in achieving the 20-20-20 target. This elaboration emphasises the improvement in Slovakia's and Hungary's positions, with a simultaneous worsening of that of Poland and the Czech Republic.

A prediction of the three explanatory variables was prepared, i.e. 'greenhouse gas emission, base year 1990'; 'share of renewable energy in gross final energy consumption'; 'primary energy consumption'. Holt's-Winters' triple exponential smoothing method was used for smoothing the analysed time series, and the results obtained are presented in Table 3.

Despite the long-time EU perspective in reference to the action plan concerning the transition to a low-carbon economy by 2050, and the new 2030 framework for climate and energy, adopted in 2014, the forecast mainly concerns the year 2020. Although the table includes the forecast for 2030, it should be treated with caution because of the long timescale. It is hard to predict the progress results of the V4 countries only on the basis of a linear trend, leaving aside other factors. Therefore, when interpreting the obtained results, we will focus on the year 2020. The outcome of the analyses carried out allows us to state that the

estimated changes in three V4 countries: the Czech Republic, Hungary, and Slovakia, will enable them to fulfil the objectives of the climate and energy framework by 2020.

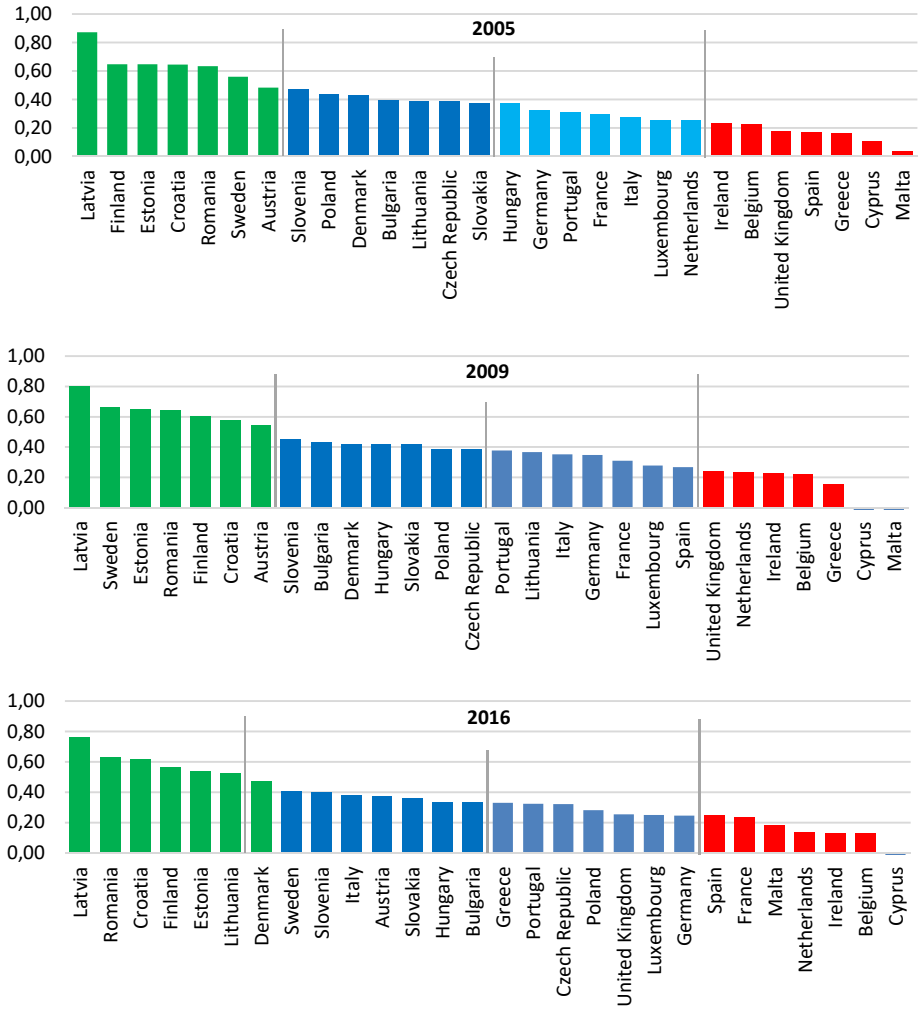


**Figure 7. The EU countries divided into typological groups in terms of the synthetic variable value in 2005, 2009 and 2016**
Source: own study.

Poland is in the most unfavourable situation of all the economies studied, despite the fact that its primary energy consumption is lower by 2.8% compared to the target of 96.4 Mtoe. Nevertheless, the estimates concerning the other two features indicate greenhouse gas emissions that will be higher by 2%, and an insufficient share of renewable energy in the consumption structure (here the difference is 0.5%).

**Table 3. Projections for 2020 and 2030 with existing measures**

| 20-20-20 target | CZ | | HU | | PL | | SL | |
|---|---|---|---|---|---|---|---|---|
| | 2020 | 2030 | 2020 | 2030 | 2020 | 2030 | 2020 | 2030 |
| **Greenhouse gas emissions, base year 1990 (%)** | 58.6 | 45.3 | 53.7 | 35.9 | 82.0 | 78.5 | 48.0 | 33.2 |
| **Share of renewable energy in gross final energy consumption (%)** | 18.8 | 26.8 | 20.0 | 29.0 | 13.5 | 18.5 | 14.9 | 20.7 |
| **Primary energy consumption *(million tonnes of oil equivalent)*** | 39.5 | 39.1 | 22.9 | 22.0 | 93.6 | 91.9 | 15.1 | 14.2 |

Source: own study.

## CONCLUSIONS

The EU has set a clear framework establishing the directions of its climate and energy policy towards reducing greenhouse gas emissions, promoting renewable sources of energy, and saving energy consumption. The framework integrates various objectives, including the improvement of the energy security level of the EU member states. This priority is of high importance for the V4 countries, heavily dependent on the import of energy materials. Moreover, the structure of energy consumption in these countries is still dominated by high-carbon conventional sources: the Czech Republic and Poland rely mainly on coal, Hungary – on oil. Slovakia has relatively the most balanced structure of energy material consumption in this group of countries. The data that was collected and analysed indicates the following conclusions in terms of the three explanatory variables that were studied:

- reduction of greenhouse gas emissions: the Czech Republic, Hungary, and Slovakia had already achieved their targets for 2020 in 2016. Poland, on the other hand, exceeded the limit by 5%,
- production of energy from RSE: in 2016, the Czech and the Hungarian economies recorded shares higher than the target (by 1.9% and 1.2% respectively). Poland needed to catch up by 3.7%, and Slovakia – by 2.0%,
- energy consumption saving: by 2016, Slovakia, Poland, and Hungary had reduced energy use to the adopted target. Energy consumption in the Czech Republic exceeded the indicated limit by 0.6% – 39.6 Mtoe.

Despite some progress in implementing the 20-20-20 targets, the research carried out based on the synthetic variable shows that the aggregate measure was lower in 2016 compared with 2005 due to the mean values for the entire EU. Taking into consideration all member states, the V4 economies record an average rate in the implementation of the climate and energy framework. Slovakia and Hungary are ranked the highest in this regard, Poland and the Czech Republic the lowest. The tendencies observed thus represent a large challenge for the hypothesis about the possibility of improving the level of energy security of the V4 countries as a result of the systematic implementation of the energy and climate package. The main motif of the debate on the security of the V4 countries is their dependence on the import of crude oil and gas from Russia, a subject which has been extensively studied by Kovács *et al.* (2011). The studies carried out so far in the

context of the challenges connected with the energy security of the V4 countries, concentrated first of all on the bottlenecks in energy infrastructure and infrastructure projects in the region (Siddi, 2016). Such a vision of energy security is definitely caused by the gas crises between Russia and Ukraine from 2006 and 2009, during which the V4 countries suffered a lot. However, in the debate over energy security, it must be stressed that this is a multi-aspect phenomenon which cannot be described with one single definition – see Kruyt *et al.,* (2009), Winzer (2012) and Narula and Reddy (2015). Therefore, it seems that the V4 countries might treat the execution of the energy and climate package not only as a controversial and costly requirement of the EU energy policy – which is underlined by McKillop (2012), but also as a chance to increase this security in its all aspects. The studies carried out for this article show the necessity of the rationalisation of energy consumption and of an increase in the share of renewable sources of energy in the energy mix and the reduction of greenhouse gases in this context.

The forecasted chances of fulfilling the obligations for the year 2020 show that all the economies analysed except Poland will meet the objectives. The forecast for the structure of generation capacity in the V4 countries indicates an increase in the share of renewable energy in total consumption between 2005 and 2020 by 13.1% in Hungary, 11.7% in the Czech Republic, 8.5% in Slovakia, and 6.6% in Poland. Nevertheless, the improvement in the last two countries is not sufficient to meet the framework guidelines in this respect. However, as far as energy efficiency improvement is concerned, based on the predictions for the year 2020, we can indicate a reduction of energy consumption by 3% in the Czech and Hungarian economies, and by 2.7% in Slovakia compared to 2005. For Poland, however, a result worse by 5.9% is estimated, but even this enables the country to meet its reduction objective adopted in the framework. Therefore, it is necessary in these economies, and especially in Poland, to promote and support a number of initiatives aimed at, among other things, developing Clean Coal Technology, increasing the share of eco-fuels in transport, modernising the construction sector, developing low-carbon energy sources, etc. These actions are of crucial importance as the total abandonment of coal is currently impossible in Poland's energy mix. The worrying results of these studies concerning Poland's execution of the objectives of the energy and climate package, against the background of the remaining V4 countries, will become an inspiration for the Authors to take up, in the future, research aimed at the identification of the causes of this situation in Poland. Furthermore, the research period ends in 2016 with respect to the availability of the statistical data, yet it is worthwhile to observe that similar studies should be re-initiated, especially with regards to the end of the 2020 perspective.

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## Authors

The contribution share of authors is equal and amounted to 50% each of them.

**Agnieszka Pach-Gurgul**

Master in Economics (Faculty of Economics, specialisation: World Economy, Cracow University of Economics); PhD in Economics (Cracow University of Economics). Her research interests include EU energy policy, energy security, sustainable development, climate policy , international commodity markets.

**Correspondence to:** Agnieszka Pach-Gurgul, PhD, International Economics Department, Cracow University of Economics, ul. Rakowicka 27, 31-510 Kraków, Poland, e-mail: apach@uek.krakow.pl

**ORCID** http://orcid.org/0000-0003-1917-4679

**Marta Ulbrych**

Master in Economics (Faculty of Economics, specialisation: Foreign Trade, Cracow University of Economics); PhD in Economics (Cracow University of Economics). Her research interests include the theory and practice of international economic integration and the role of industry/manufacturing and industrial policy in the globalisation era.

**Correspondence to:** Marta Ulbrych, PhD, International Economics Department, Cracow University of Economics, ul. Rakowicka 27, 31-510 Kraków, Poland, e-mail: ulbrychm@uek.krakow.pl

**ORCID** http://orcid.org/0000-0003-3886-371X

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# Strategic Challenges of Mergers and Acquisitions in the Higher Education Sector

**Łukasz Sułkowski, Robert Seliga, Andrzej Woźniak**

**ABSTRACT**

**Objective:** The aim of the article is to present the issue of mergers and acquisitions of universities with reference to academic entrepreneurship.

**Research Design & Methods:** The research methodology in the article was based on comparative analysis of case studies of universities mergers. The article is of an illustrative nature and constitutes a starting point for further in-depth research in the field of university mergers and academic entrepreneurship.

**Findings:** One of the consolidation motivations in France was to build strong links between universities and enterprises, which is supposed to fuel economic, scientific and technological development. Key mechanisms to drive a wave of strategic mergers in the public university sector that is sweeping through the world are global rankings.

**Implications & Recommendations:** Consolidations of HEIs should also based on effective human capital management and entrepreneurial organisational culture. Nowadays, in the process of university merger research, we are at the induction stage, where hundreds of case studies and few comparative studies have been gathered that draw a complex picture of mergers and can serve as a source of practical guidance.

**Contribution & Value Added:** International comparison of mergers of Polish and French public universities that lead to recommendations on macro level of public policy and on mezzo and micro level of university management.

**Article type:** research article

**Keywords:** university mergers; public university; university management; mergers and acquisitions (M&A); higher education sector; academic entrepreneurship

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## INTRODUCTION

A characteristic feature of modern economy is the existence of many different economic entities that can be grouped according to the type of their business activity. Business entities, most often enterprises, operate within the framework of meso-structures taking a competitive (competitive sector) and sometimes a synergistic form (cluster). The higher education sector is atypical because it is dominated by non-enterprise economic entities, and competitiveness is regulated and limited by state intervention. The rapid development of the higher education sectors all over the world is, moreover, associated with the growing importance of intellectual capital and the transfer of knowledge that distinguishes modern economies from industrial economies (Mačerinskienė & Aleknavičiūtė, 2017). In this sense, the higher education sector is the backbone and the source of most modern production and service sectors. The issue of competitiveness is a strategic problem both from the point of view of the development of the entire sector and the market players operating in it. M.E. Porter analyses the relation between the competitiveness and profitability of an economic entity and the attractiveness of the sector in which this entity operates.

The merger process that is currently taking place in the higher education sector can be called 'merger-mania'. In an attempt to analyse literature and research results in the field of university mergers, it can be noted that in some educational systems it is already an advanced process of a hundred years or more. Extensive merger programmes are or have been implemented in China, South Africa, the USA, France and Norway, among others. In many countries strategic mergers of large public universities are being implemented. It happened in Finland, Sweden, France and even Vietnam (Pinheiro, Geschwind, & Aarrevaara, 2016). In most countries the consolidation of universities is a bottom up process, but the tendencies to connect at the central level are reflected in public policies. In some countries, for example in South Africa, Russia, China and Norway, top-down consolidations, which are more controversial, are also conducted (Karodia, Shaikh, & Soni, 2015). The objectives of mergers are therefore diverse and may include: entry into the 'world league of universities', rationalisation of education and research networks, as well as restructuring aimed at increasing the efficiency of the education process (Cai, 2016). A specific objective pursued through mergers may be to increase the access and quality of higher education addressed to disadvantaged groups. This was the idea of consolidation and transformation of higher education in South Africa.

The aim of the article is to present the issue of mergers and acquisitions of universities with reference to academic entrepreneurship. The research methodology in the article was based on a case study of the university. The article is of an illustrative nature and constitutes a starting point for further in-depth research in the field of university mergers and academic entrepreneurship.

The structure of the article is organised in the following way. In first part literature review about mergers and acquisitions in higher education sector was conducted. Secondly, the methodology was described. Thirdly, results and discussion were presented. The article ends with the conclusion.

## LITERATURE REVIEW

When attempting to analyse management processes at universities, it can be noticed that many classical management concepts have been implemented into these processes. This implementation has the characteristics of adaptation, which takes into account the broad specifics of educational services at the higher level. Universities provide educational services and operate in an environment that has a major impact on their activities (Soni & Govender, 2018). Therefore, the choice of strategy depends to a large extent on such factors as the legal form of the university or its specialisation (Mihi-Ramirez, 2016).

Looking forward, it can be stated that the university of the future will largely rely on strategies that will be integrated with the university's organisation, will be supported by analytical and IT tools and programmes and which will more and more accurately allow the verification of key areas of the university, e.g. the science area – evaluation of the scientific achievements of the entity. Strategies will include scientific, educational, implementation as well as organisational, market and financial activities. The management information systems at universities are already developing at the moment, enabling quick market and strategic analyses. The management and administration of higher education institutions increasingly use new tools of controlling, process and project management that serve the decision-making process (Hladchenko, 2015).

Strategic management plays a key role in consolidation processes (Pinheiro & Stensaker, 2014). First of all, the decision about consolidation itself should be preceded by a strategic analysis of the organisation and the environment, which is the premise for making the decision on the merger (Andriuskevicius & Ciegis, 2017). There should be consultations with various stakeholder and due diligence groups. In the case of a non-public university, making merger decisions is usually faster and simpler. In public universities the decision-making process is usually complex and requires the participation of various stakeholder groups. The strategic objectives of the merger should be set, which will be the basis for the preparation of the strategic plan (planning stage). The adoption of the strategic merger plan is related to the transition to the process of strategic coordination of the merger (implementation stage). Strategic management at this stage consists in drawing conclusions from due diligence and participating in negotiations and concluding contracts (Sulkowski, 2016). Institutionalisation of the merger – in the form of signing agreements and validating the decisions on the consolidation of entities – closes the implementation stage and constitutes the transition to the integration stage (Sarkar & Perenyi, 2017).

Strategic management consists in planning and implementing decisions regarding the allocation of the entity's resources, aimed at: (1) implementing the strategic goals of the entity, (2) implementing the strategic plan, and (3) increasing the adaptation degree of the entity's activities to the environment. Strategic management of a university, a public one in particular, will serve to achieve goals that are determined by the type of organisation and key stakeholders (Mokhuba & Govender, 2016). In the case of private entities the founding structure is the decisive body in determining the strategic objectives, while in the case of public universities – university managers, representatives of the staff and students along with political decision-makers (Vilys, Jakubavičius, & Žemaitis, 2015).

The level of autonomy in making strategic decisions depends on the type of university, its statute and structure of power. Undoubtedly, decisions about mergers belong

to the strategic level due to their importance and a long time horizon of implementation. Mergers should not be a strategic goal but only a method of achieving it or, possibly, a tactical goal. Strategic goals are the achievements of key importance for the organisation in the long term. The mission of an organisation should reflect the sense of its existence. It is intended to justify the role of the entity both from the point of view of its founders, as well as society, employees and other key stakeholders. The strategic goals and the mission of the university are determined to a large extent by the type of organisation that usually performs a scientific and educational mission and cooperates with the environment (the so-called 'third mission').The mission and strategic goals of a public university include the implementation of mainly non-commercial aspects of its activity, while non-public, and in particular private, profit-making universities pursue commercial goals (Van der Wende, 2014). According to the assumptions of the planning school, the strategy should be reflected in the strategic plan. The strategic plan includes: (1) strategic objectives, (2) time perspective of the implementation of activities, (3) a sequence of steps (stages) leading to the achievement of the objectives, (4) defining the resources necessary to achieve the objectives and the way they will be used.

## MATERIAL AND METHODS

The research methodology used is of a qualitative nature and is based on a comparative analysis of merger studies between universities. A comparative analysis of university merger cases was conducted on the basis of a set of research indicators developed in the study. In the encoded material from in-depth interviews, statements were sought reflecting the diverse opinions of respondents in relation to research indicators. 13 areas and 31 research indicators were proposed. Then an attempt was made to synthetically compare the cases using all available data obtained with the following techniques: in-depth interviews, documentation analysis, participant observation, auto-ethnography and duo-ethnography. Data obtained from in-depth interviews, the comparison of which made it possible to draw conclusions, turned out to be of key importance. The research presented in the article is of a pilot nature and serves as a preliminary answer to the key questions for the value of the article and effective ways of implementing the consolidation of the university. The attempt of two cases of consolidation of the university was selected on purpose, the choice was based on the criteria of: data availability, literature on the subject and the experience of its authors. The sample is heterogeneous, as it describes university mergers: carried out at different times, between different types of universities, in two countries.

## RESULTS AND DESCUSSION

### Case Study 1: Strategic consolidation and the establishment of Université Grenoble Alpes (UGA)

#### Characteristics of the Universities

**Université Joseph Fourier**

UJF, also known as Université Grenoble I, was established in 1971 from the transformation of the faculty of science founded in Grenoble by Joseph Fourier in 1811. The name of Joseph Fourier was born by the university since 1987. This oldest university in

Grenoble existed until the end of 2015, until it merged with two other universities forming UGA. The University educated 15 000-18 000 students, mainly in the natural, technical and medical sciences, such as: chemistry, biology, geography, physics, computer science, mathematics, medicine and pharmacy.

UJF occupied fairly high positions among French universities in international rankings. In THE ranking in 2012, it ranked 180th and 155th in 2013. It was also in the group of the first 150 world universities and the first ten French universities. Under the decree on the merger of three Universities of Grenoble, which entered into force on January 1, 2016, it became part of the Université Grenoble Alpes.

**Université Pierre Mendès France**

Université Pierre Mendès France – Grenoble, operated also under the name Grenoble II and the abbreviation UPMF in 1970-2015. Grenoble II was established in 1970 by the law on higher education from 1968. One of the tendencies that resulted from this regulation was the appearance in France of more specialised research institutes and, at the same time, universities. Grenoble II arose from the separation of a part of the department of humanities and social sciences, including: psychology, sociology and history.

The amendment to the act regulating the functioning of the university in 1984 caused the change of the university statute in the next year. The name 'Pierre Mendès France' (UPMF) was in force since 1991, when the first contract was signed with the Ministry of Higher Education. In 2009, by the agreement in the consortium of PRES Université de Grenoble, UPMF became a member of the Université Grenoble Alpes university group. According to the decree of 2015, the university ceased to exist on January 1, 2016, forming part of a consolidated university under the name Université Grenoble Alpes (UGA).

**Université Stendhal**

Université Stendhal (Grenoble III) existed in the years 1970-2015. It was created in 1970 and from the beginning it was named after the famous French writer Stendhal. The university originated from the division of a large department of humanities and social sciences at the University of Grenoble. Grenoble III specialised in research and higher education in the fields of humanities and the fields of art, such as: philology, linguistics, literary studies, cultural studies, social communication, journalism and theatrology. The most important educational programmes were: English philology, French and other philologies, linguistics and other humanities. The university was also traditionally involved in the education of secondary and primary school teachers in the humanities. At the turn of the 20th and 21st centuries, Grenoble III educated about 4 000 to 5 000 students and about 3 000 more in its branches.

**The Course of the Merger**

The University of Grenoble was founded in the 14th century (1339) and survived, repeatedly transformed, until 1968. The introduction of a reform strengthening the autonomy of research and teaching centres led to the division of the university into four specialised sister colleges according to the department key. The beginning of the 21st century in France brought 'Shanghai shock', which was associated with the poor positions of French universities in arising and gaining importance in international rankings. Positive consolidation experiences in higher education in many countries encouraged the universities of Grenoble to undertake the pioneering task of joining the universities, which began with the

creation of a strategic alliance. In 2002, a cooperation was established under the name of Grenoble Universités, which covered all four public universities in Grenoble. In the negotiation process, the University of Technology decided not to move towards the consolidation, while the others planned, communicated and effectively implemented the merger. The Grenoble Universités consortium became an umbrella that enabled the development of cooperation as well as consolidation. In 2003, the ministry proposed a programme of cooperation between the university and the environment, including a consolidation concept. In 2004 Minister Jean Marc-Monteil wrote a letter to the university encouraging the creation of local partnerships with universities and promoting integration. Then, improvement programmes were centrally implemented, which also promoted consolidation.

In 2009, as part of the implementation of the ministerial PRES programme (research and higher education centres), the merger of Universities with Grenoble was announced, which was supposed to start from January 1, 2016. A negotiation and integration team was established, in which representatives of all universities, as well as central and local authorities and external stakeholders participated. Consolidation received strong financial and substantive support from the French Ministry of Higher Education. As a result of strategic analyses, research and negotiations, the following were agreed: the strategy and stages of the merger, the structure of the consolidated university, the new name and the authorities of the consolidated university.

On September 11, 2015 a decree on the merger of three universities in Grenoble was signed, which entered into force on January 1, 2016. By virtue of the decree, the Université Grenoble Alpes was created, which merged three Grenoble universities into one. The university's rector was Lise Dumasy, the rector of Université Stendhal for three tenures. Vice-rectors were the managers representing the merging universities. In the restructuring process, a new strategy and organisational structure was created. The new strategy is focused on cooperation with the environment, innovation and implementation, as well as internationalisation and development of high quality research and didactics within a comprehensive university. The mission underlines the growing role of international interdependence, innovation, interdisciplinary research and implementation. It also confirms that the heart of the university's activity is the combination of education and research.

In the consolidation process, a new information system was also implemented, covering the university management, but also the entire scientific output of employees and units, international relations and education quality management. New websites for the university and all units were also created, which was coupled with marketing activities, oriented towards the Internet and social networking sites in particular.

During the consolidation, changes were also made in the area of HR management. A deepened specialisation between research and teaching staff was introduced. Also, evaluation, remuneration and development systems rewarding higher productivity (performance based systems) were introduced. The positions, salaries and development opportunities of employees from different disciplines are differentiated. Representatives of exact, natural and technical sciences gained the greatest chances of development, and humanities and social sciences – slightly smaller.

**Merger Barriers**

According to information taken from interviews, the most important barriers to mergers included psychological, social, organisational and legal constraints. From the beginning of

the process of formalised cooperation, the concerns of the academic staff and administration that consolidation may worsen working conditions or lead to weakening of influence arose. The way to dispel these fears was communication, consultation and providing employees with working conditions that were at least on the same level as before the merger. The staff participated in the preparation of the merger through systematic meetings in the framework of inter-university integration teams for several years. The involvement of employees in the merger was quite high due to the 'Shanghai shock', the chances of using central programmes and the sense of creating a valuable and to some extent pioneering organisational solution in France. A certain social barrier was the formation of groups disturbed by the merger and the conservative attitude of trade unions. Long negotiations, which allowed for a compromise, were necessary. The Technical University of Grenoble, although initially discussed the merger, retreated in the course, mainly due to social resistance. The polytechnic staff did not know if the merger would bring them sufficient benefits to compensate for the partial loss of independence. The merger planning was carried out carefully, as was due diligence. Among the organisational barriers, the key role was played by attachment to the organisational structures and cultures of the universities. The impact of this obstacle was stopped by limiting the restructuring of scientific and didactic units. Departments, institutes, and even chairs remained largely without major changes. The deep transformation concerned support structures. A favourable factor was the early announcement of the consolidation date (2009). Political barriers were rather absent, both the ministry and local authorities favoured consolidation and actively supported it. Some legal limitation was the need to implement many laws and regulations that required time. Financial barriers practically did not appear, because the consolidation was co-financed under the Ministry's programmes.

**Merger Effects**

Université Grenoble Alpes currently educates over 45 000 students and employs 5 500 employees in over 80 organisational units. The merger brought first results in the form of: intensification of scientific activities, improvement of organisational and managerial efficiency and generation of savings from consolidated processes and structures. Naturally, it is difficult to assess the effects of the merger due to the short time of its implementation, but the mere comparison between international rankings before and after the consolidation provides valuable information.

In eight scientific disciplines, UGA is in the world top 50, and in the next nine in the first hundred. In the Leiden (CWTS) ranking, UGA was classified on the 159th place and on the 7th in France. The position in the field of publications in physics, technical sciences, life sciences, earth sciences, mathematics and computer science is particularly high. In the Times Higher Education (THE) ranking, UGA was ranked 52nd in 2017. The QS World University Rankings ranking places UGA in the group of the best universities in 13 scientific disciplines. UGA also received the IDEX scientific excellence certificate. In the Thomson Reuters classification 'Reuters Top 100: The World's Most Innovative Universities' UGA achieved 93th position in the world and 6th in France and 20th in Europe.

**Prospects**

The first, positive effects of the consolidation create the prospects for achieving the strategic goals of consolidation in the coming years. UGA implements mechanisms that dyna-

mise scientific activity, which has improved its position in national and international rankings in the last two years. Much effort was required from the employees to adapt to the new situation, which means that the results of scientific and didactic activities should improve year by year. The interviews indicate improvement of consolidated university management through: more effective strategic management, real emphasis on international cooperation and cooperation with the environment, effective marketing communication and more advanced financial management and accounting. Employees mention faster and more efficient operation of administrative units compared to the situation before the merger. There is a gradual increase in the number of English-speaking students and programmes, which favours the internationalisation of the university. The UGA didactic offer was expanded, and at the same time unified and modernised.

**Case Study 2: The merger 'out of sectoral, stimulated from the top necessity' – the Medical University is being created**

**Characteristics of the Universities**

**Medical Academy in Łódź**

The Medical Academy in Łódź functioned in the years 1949-2002, at the end of its activities the active departments were: medical (including a nursing unit), dental, public health and pharmaceutical (including a branch of medical analytics).

The establishment of the Academy was made possible by the following legal act: Regulation of the Council of Ministers of October 24, 1949 on the creation of medical academies in Warsaw, Krakow, Poznań, Lublin, Łódź and Wrocław. On its basis, the departments operating at the University of Łódź: pharmaceutical, medicine and dentistry joined into an independent university at the beginning of the 1950s. The university ceased to exist in accordance with the Act of the Sejm of the Republic of Poland dated July 27, 2002 on the establishment of the Medical University in Łódź.

**Military Medical Academy**

In 1946, the Military and Medical School of Feldshers was established in Łódź, which took over the function of the Chair of Military Medicine, operating in the years 1944-1946 at the Maria Curie-Skłodowska University in Lublin. In 1950, the Military-Medical Faculty for military doctors was established in the structures of the Medical Academy in Łódź, as the foundation for the future Military Academy.

From July 1958, the Military Medical Academy (WAM) existed on the basis of Resolution No. 477/57 of the Council of Ministers of the Polish People's Republic of November 7, 1957 until 2003. It was attended by soldiers – military medical officers (doctors, pharmacists, dentists and psychologists), not only for the needs of the Polish armed forces, but also for forces belonging to other states. The base was the Central Clinical Hospital of the Ministry of National Defence in Łódź. The Academy used the resources of the Medical Academy in Łódź, numerous clinics and chairs were established on the basis of the Academy's civil structure units. Twenty-three independent academics from the Medical Academy were employed at WAM, which also received auxiliary scientific workers, lab technicians and a technical employee. In 1958, the 'Principles of cooperation between the Medical Academy and the Military Medical Academy' were implemented. They regulated the teaching of WAM students

in medicine and in the field of pharmaceutical studies, employing Medical Academy employees in the Military Medical Academy, sharing facilities needed for conducting classes and research, providing medical equipment, participating in exams and student recruitment. The order of the Ministry of National Defence from May 19, 1958, according to which from the beginning of July the Military Medical Academy, based on the Military Medical Training Centre, was to be created, was also of great importance.

The Academy changed under the influence of the restructuring of the Polish Armed Forces that was taking place since the 1990s. The number of employees, units and students decreased, and there were significant budget restrictions. Under the influence of these changes, WAM became a military-civil university, in 1998-1999 civilians were offered two fields of study: public health and physiotherapy in part-time mode. In view of the reform of the higher military education introduced by the Ministry of National Defence, the Academy actually had to cease to exist, because there was no longer a ministerial training system for military doctors. The Academy authorities began to strive to connect with the Medical University in Łódź to save the status of the university and years of academic work and research.

**The Course of the Merger**

Preparations for the merger of universities lasted from 2000. In December that year, the Inter-University Team for Integration was set up, in which the authorities of the University of Łódź participated together with the representatives of the Medical Academy and the Military Medical Academy. Originally, it was planned to combine these three universities in the structures of the Department of Health Sciences of the University of Łódź. This project, however, was not implemented, mainly due to resistance from the medical community and the lack of a solution to the difficult financial situation of many clinical hospitals in Łódź. On the side of the Medical Academy in Łódź, there were concerns that competition in the form of medical departments at the University of Łódź may arise, hence the MA authorities adopted a much more open attitude towards the merger. At the same time, WAM lost its funding base due to a departure from medical military education. This created a compulsory situation in WAM, when the top-down financial pressure forced the university to connect with the other one. The advantage of the merger for both universities was the possibility of prestigious and scientific promotion to the level of the Medical University. On April 8, 2002, a letter of intent was signed regarding the merger of the Medical Academy and the Military Medical Academy and the establishment of the Medical University of Łódź.

**Merger Barriers**

The factor conducive to the merger was raising the rank of the consolidated university. Thanks to the merger two academies have become a university. However, despite the prestige promotion, the merger was accompanied by many tensions that had financial, organisational, cultural, social and even personal sources.

Conducted interviews indicate four most important sources of consolidation barriers that occurred during the merger of MA with WAM.

1. Forced and top-down nature of the merger.
2. Problematic situation of a deficit in the activity of many clinical hospitals.
3. Poor preparation for the consolidation process.
4. A sense of threat among scientific, didactic and administrative employees.

5. Organisational, cultural and personal tensions between universities.
6. Poor financing of the merger and lack of central support in the integration process.

Most of the respondents from the former WAM emphasize that the merger was practically forced, although of course it required the consent of the senates of both universities. WAM could not remain an autonomous university because it did not have adequate sources of central financing. On the other hand, the respondents from former MA emphasize the compulsion of their own situation, because the prospect of establishing medical departments at the University of Łódź was a great source of danger. The merger was top-down, it took place with considerable participation of the central government, because the decisions were taken by the ministers of health and national defence, of course with the approval of both universities. The situation of 'forced consolidation', which resulted from changes in the methods of financing military medical education, created pressure on WAM, which had to make a decision about entering the MA structure. The consequence of this was the negotiation process that led to the creation of the Military and Medical Department. This created the situation of an apparent unification merger. The Medical University was supposed to have a unified, not federal structure, but internal tensions led to the creation of the aforementioned department. The department along with the WAM hospital are the main units employing the staff from the former WAM.

Deficit clinical hospitals strengthened the problem of the merger and practically prevented a wider regional merger between regional universities with the participation of the University of Łódź.

Poor preparation for the consolidation was associated with the lack of analytical and preparatory processes. Before the merger, no strategic analyses had been carried out, and due diligence was lacking. The employees were informed about the merger, but it was not a consultation process. Strategic integration planning was also lacking. The consolidation took place through a one-time parliamentary law and hurried out organisational transformations, which resulted in a smouldering conflict between the group holding power in the former Medical Academy and a group of influence from the Military Medical Academy.

The sense of threat among the scientific-didactic and administrative staff was born out of uncertainty and organisational activities accompanying the merger. The consolidation did not improve the financial position of the consolidated university, which for many years after the merger experienced financial problems related to the construction costs of the Clinic and Didactic Centre (CKD) started in mid-1970s, as well as the deficit related to the operation of clinical hospitals. The consequence were low wages at the Medical University and cost cutting processes that included various groups of employees, including administration and senior lecturers. These were restructurings forced by the financial situation, which increased efficiency, but reinforced the sense of threat for some employees. Low wages meant that the vast majority of teaching staff also worked in other places outside the university.

Organisational, cultural and personal tensions between the employees of the former academies have been going on till this day. Despite 15 years after the merger, interviews with university staff reveal a tension manifested in the antagonism: us and them. It is visible in situations where the most important decisions are taken, for example about choosing the rector. It also involves seeking by the group of influential WAM professors the possibility of making the military-medical structure independent from the Medical University.

One of the sources of the antagonism is also the great solidarity of the milieu of military doctors, which was strengthened by the 'forced' solution of merger processes.

The consolidation was not accompanied by significant central support. On the contrary, in the following years, the financial pressure on the Medical University increased, related to the costs of completion of the CKD construction and the deficit related to the operation of clinical hospitals. The implemented restructuring was of the cost cutting character, but it did not involve the creation of efficient controlling.

**Merger Effects**

Thanks to the merger, the Medical Academy in Łódź became the Medical University, which was a prestigious promotion, resulting from an increase in the scientific and didactic potential. The direct effect was also the broadening of the clinical and didactic base. The merger contributed to improving the rankings, both domestic and international ones. On the other hand, the effect of the merger is the strategic, structural and cultural tension, as well as lasting personal tensions. According to the worldwide ranking of universities, Webometrics Ranking of World Universities in 2013, developed by the Spanish institute Consejo Superior de Investigaciones Científicas, the university took the 7th place in Poland among medical universities, and 2707 in the world from all types of universities.

**Prospects**

The integration of both universities is relatively slow and there is a clear distinction between them. The 'military' personnel form their own Military and Medical Department. Ideas are also sought for the possibility of rebuilding and re-separation of military medical education. Quite clear, though remaining within the Medical University, are also tensions between these two groups of influence. The merger did not lead to full integration. The University representatives emphasize that the Military-Medical Department has poor results in the Medical Final Examination, while the graduates of the Department of Medicine of the Medical University have good results.

Mergers between universities, just like in business, do not easily succumb to managerial control and project management, which would enable full implementation of the objectives. Table 1 presents factors determining mergers in higher education.

## CONCLUSIONS

The consolidation of universities is a major theoretical and practical challenge. There is a very large number of practical examples of university mergers in the world, but at the same time a shortage of theory that would help manage consolidations. One of the promising concepts is the social identity approach, other concepts are: M&A strategic and process theories (Gleibs, Tauber, Viki, & Giessner, 2013; Cai, 2006). In the public sector, the basis for analysing the concept of consolidation are the theories of new public management (NPM) and public value management (PVM). Nowadays, in the process of university merger research, we are at the induction stage, where hundreds of case studies and few comparative studies have been gathered that draw a complex picture of mergers and can serve as a source of practical guidance. In an attempt to take advantage of these experiences, ten principles of effective management of university mergers that cover the entire process, from planning, through implementation to integration, can be proposed (Figure 1).

**Table 1. Factors Determining Mergers in Higher Education**

| Factors | Public universities | Private universities |
|---|---|---|
| **Limitations of the implementation of university mergers** | conservatism of traditional academic cultures | organisational culture adapted to the needs and strategy of the organisation |
| | strong ethos of academic professions often oriented towards maintaining the status quo | moderate ethos, fairly strong adjustment of the academic staff to the current requirements of the organisation |
| | dominant stakeholder model that fosters a compromise between impact groups | |
| **Factors that increase the chance of successful mergers** | relative homogeneity of merging organisations (very similar type of activity, similar founding or ownership structure) | quite limited number of decision-making stakeholders involved in the merger process |
| | merging, in most cases, universities coming from one country (lack of far-reaching cultural and legal differences) | merging universities with the same educational profile |
| | benefits of the merger that may exist, in many cases, for all merging universities | benefits of the merger that may exist, in many cases, for all merging universities |
| **Impact on the dynamics of the merger process** | competitors in Poland and around the world, potential new competitors and substitutes (other forms of education, industrial science etc.); | the dynamics of the merger process depends to a large extent on the factors determining decision making by decision-makers participating in the merger process |
| | cooperation network, consisting of national and international entities cooperating with universities | |
| | internal stakeholders, i.e. staff, students and university administration; | |
| | external stakeholders, i.e. ministries, central and local government, employers | |
| | public policy, reflected in the law, university funding and central and local programmes | |

Source: own study based on the research results.

Mergers and acquisitions belong to complex organisational processes. First of all, because they constitute a radical change which the entire organisation is subjected to in a relatively short time. Despite the rich literature of the subject, many studies and vast practical experience, consolidation processes, in most cases, do not fully achieve the goals or fail. Probably the processes of mergers and acquisitions are too complex, multidimensional and entangled in cultural and social factors to be fully controlled. Running merger processes are very often spontaneous, and the trajectory of revolutionary cultural change becomes partly indeterministic.

In the further environment there are variables that influence the course of the session and the functioning of the universities. Economic factors, such as: living standards, boom, unemployment, have a significant impact on the motivation to start a merger. One can risk a thesis that the deterioration of the country's economic situation should become a catalyst for a wave of mergers, especially in dispersed higher education systems. Demographic variables, related to fertility and the flow of human capital, form the basis for assessing the demand for higher education at the national level. Lower demand for studies is one of

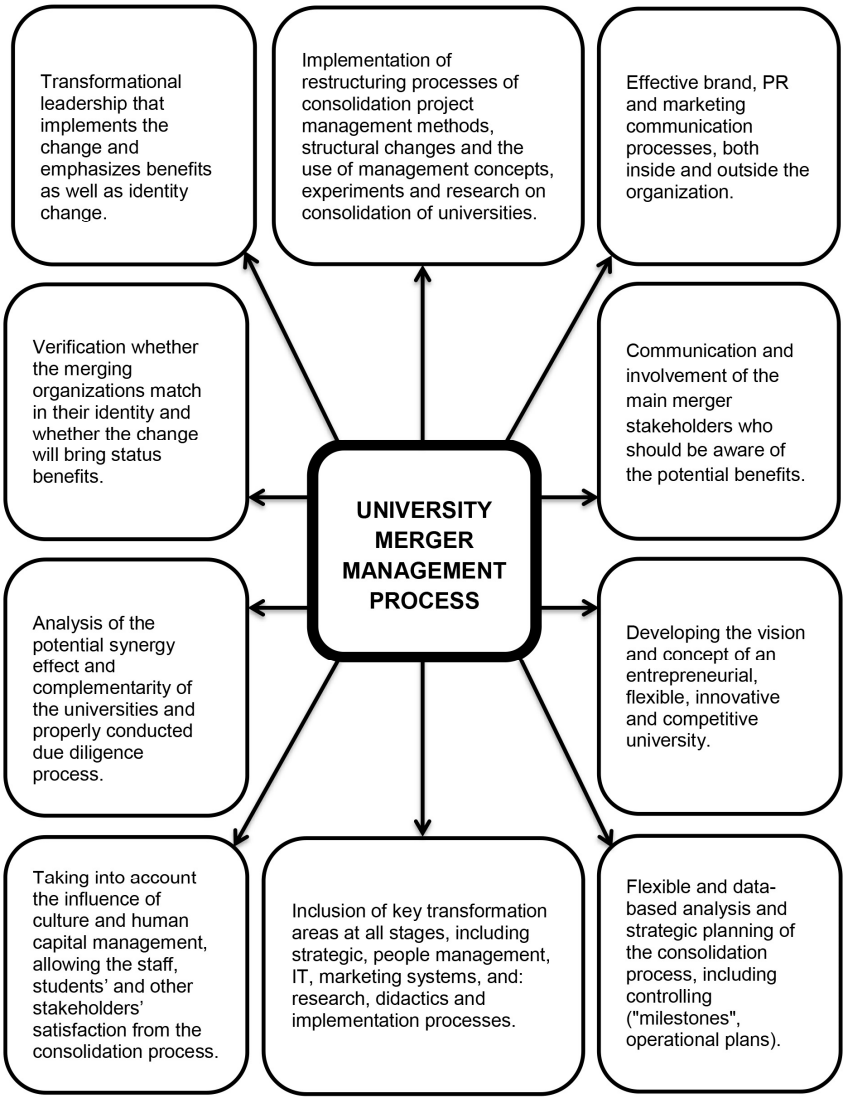


**Figure 1. The process of university management process**
Source: own study based on the research results.

the reasons for consolidation of universities, which can be observed, for example, in Poland, Romania and the Baltic States (Rădulescu, Rădulescu, Ovidiu, Rădulescu, Rădulescu, & Naş, 2016). Social factors relate to the level and structure of scholarisation in a given country. Social patterns have a significant impact on decisions to study and choose a programme, with the transformation from an elite to an egalitarian higher education system into a global megatrend. The waves of systemic mergers, carried out, among others, in China, EU countries and the USA in the 1990s, were designed to better adapt to the mass and even universal model of education (Mao, Du, & Liu, 2009). The cultural context also

has a significant impact on consolidation processes, although the assessment of its impact is very difficult. Culture not only shapes the organisations themselves and the behaviour of people in organisations, but also affects the functioning of the entire education system, and even the dynamics of the consolidation process. In countries with high levels of social capital, with developed civic culture, university mergers are more likely to be successful. However, there are positive and negative examples that contradict this thesis. Successful centralist mergers in China, on the one hand, prove that even in a society with a relatively low civic culture, it is possible to effectively implement the consolidation of universities (Cai & Yang, 2016). On the other hand, some failed mergers in the UK and Australia prove that culture is only one of the variables in the complex mosaic of impact factors (Martin, 1996). An important role in the processes of university consolidation is also played by the scientific and technological environment. It is connected with the progress of science requiring the reorganisation of research units, which takes place through internal restructuring, the creation of cooperation networks and mergers. The general tendency is the concentration of scientific units, which leads to the creation of a 'critical mass' that allows the implementation of ambitious research projects and the development of renowned scientific schools. New technologies emerge in the cooperation of universities with the industry and through the creation of spin-offs. One of the consolidation motivations in France was to build strong links between universities and enterprises, which is supposed to fuel economic, scientific and technological development. New communication and network technologies also have direct impact on conducting research (e.g. methods, laboratories) and education (e.g. on-line education). Distance education opportunities were one of the motives for combining even distant campuses and colleges. Global variables are related to the internationalisation of science and higher education and the development of global competition. One of the key mechanisms to drive a wave of strategic mergers in the public university sector that is sweeping through the world are global rankings, such as: Academic Ranking of World Universities – Shanghai Ranking Consultancy, World's Best Universities Ranking – US News & World, THE World University Ranking – Times Higher Education, U-Multirank. In globalisation, English-speaking countries (USA, United Kingdom, Australia) have a competitive advantage due to the international role of English and the academic and educational position of their universities. In many countries, mergers are carried out to internationalise the university by: opening joint programmes (joint, dual and double degrees) and English-language programmes, attracting foreign students, strengthening academic and didactic exchange. Knowledge capital means the development of competences regarding the consolidation of universities based on research projects taken not only from the education sector, but also from business, as well as from experience and studies of merger cases. The growing number of publications, research and cooperation projects convinces that consolidations may lead to the implementation of many strategic goals and may affect both private and public universities. Knowledge about potential risks and threats of consolidation processes is also better, which allows to plan future mergers more effectively.

The example of consolidation – Grenoble – indicates that the return to the identity and heritage of the University of Grenoble from over 40 years was a strong integrator. The opposite situation occurred in the case of the second described study – AM with WAM. In this case, the merger did not lead to full integration. In the case of UGA mergers, all support

structures have been designed and implemented as university-wide and integrated units. There was also a high degree of interaction and cooperation within the inter-faculty matrix structures. Consolidations should also develop effective human capital management. An example is the diversification of career paths, which occurred, for example, in UGA during consolidation. In the case of the merger of AM with WAM there were many barriers affecting the merger. Some of them concerned the area of human resources (organisational, cultural and personnel tensions between universities) and the finances of entities.

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## Authors

The contribution share of authors is equal and amounted to 33,3% each of them.

**Łukasz Sułkowski**

Professor of economics and humanities. Chair of HEI Management Department at Jagiellonian University in Cracow, at Clark University (USA) and at the University of Social Sciences. He was the main investigator of 11 research grants (including grants from the State Committee for Scientific Research, the National Science Centre and European Union). Holds numerous awards from the Rector of the Jagiellonian University, Clark University and University of Social Sciences. Łukasz Sułkowski specialises in management sciences.

**Correspondence to:** Prof. Łukasz Sułkowski, Jagiellonian University, Institute of Public Affairs, ul. prof. St. Łojasiewicza 4, 30-348 Kraków, Poland, e-mail: lukasz.sulkowski@uj.edu.pl

**ORCID** http://orcid.org/0000-0002-1248-2743

**Robert Seliga**

Assistant Professor, He obtained his master's degree in management and marketing from the University of Social Sciences in Lodz. In 2009 he obtained his PhD in economic sciences. Robert Seliga specialises in management sciences.

**Correspondence to:** Dr Robert Seliga, University of Social Sciences in Lodz, ul. Sienkiewicza 9, 90-113 Łódź, Poland, e-mail: rseliga@san.edu.pl

**ORCID** http://orcid.org/0000-0003-3306-904X

**Andrzej Wozniak**

Assistant Professor, He obtained his master's degree in management and marketing from the University of Social Sciences in Lodz. In 2013 he obtained his PhD in economic sciences. Andrzej Wozniak specialises in management sciences.

**Correspondence to:** Dr Andrzej Wozniak, University of Social Sciences in Lodz, ul. Sienkiewicza 9, 90-113 Łódź, Poland, e-mail: awoznak@san.edu.pl

**ORCID** http://orcid.org/0000-0002-9816-047X

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# Positive Deviance as a Mediator in the Relationship Between High Performance Indicators and Entrepreneurial Orientation

**Przemysław Zbierowski**

**ABSTRACT**

**Objective:** The purpose of the article is to investigate positive deviance as a mediator in the effect of high performance indicators on organisational entrepreneurship.

**Research Design & Methods:** The research was carried out on a representative and random sample of 406 enterprises using multi-source cross-sectional design. The main analytical technique is structural equations modelling.

**Findings:** The impact of high performance indicators on positive deviance is somehow ambiguous. Some of the factors influence positive deviance in a positive way (continuous improvement, openness and action orientation, management quality) and some in a negative way (workforce quality, long-term orientation). Positive deviance has a positive effect on all three dimensions of entrepreneurial orientation. However, rather unexpectedly, the effect is the weakest for innovativeness. The study revealed general indirect effect of high performance factors on dimensions of entrepreneurial orientation with the mediation of positive deviance.

**Implications & Recommendations:** The study has implications for research and practice. It partly explains the effects of high performance indicators for organisational entrepreneurship. Companies that are in pursuit of higher organisational entrepreneurship can use it as a good way of supporting it.

**Contribution & Value Added:** The study contributes to research on high performance and entrepreneurship mainly by drawing attention to positive deviance as a mediator in the effect of high performance factors on organisational entrepreneurship.

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|---|---|
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## INTRODUCTION

High organisational performance is one of the end results that are investigated in management science (De Waal, 2012). Scholars and practitioners for decades have tried to unlock the mystery of extraordinary outcomes and answered the question why some organisations are extremely successful while others fail. One of the most coherent frameworks of high performance indicators has been presented by De Waal (2012). However, the author claims that it only answers the question 'what' high performers do to be successful and not 'how' they do it. Therefore, the article is placed in the research stream that attempts to uncover the mechanism underlying the activities of market leaders. The study argues that a lot of explanation in that regard could be proposed by another dynamic research notion – positive organisational scholarship (POS). It draws attention to phenomena that are normatively positive and extraordinarily effective. One of the most interesting of them is positive deviance. Therefore, this study examines its role in organisational processes and the purpose of the article is to investigate if positive deviance is the mediator in the relationship between high performance indicators and organisational entrepreneurship. The reason behind the choice to include the latter construct is twofold. That relationship was researched previously only in direct manner and organisational entrepreneurship (conceptualised as entrepreneurial orientation) has been positively linked to high performance.

To test the mediation effect the present study uses the random and representative sample of 406 organisations and test the hypotheses using structural equations modelling. The research is novel in its approach to putting positive deviance at the heart of high performance processes within the organisation. The contribution that it is trying to make is threefold. First, it explains the way in which positive deviance has effect on organisational entrepreneurship processes within an organisation. Second, it contributes to entrepreneurial orientation literature by explaining its antecedents. Finally, it contributes to high performance organisation literature by answering the question how high performance characteristics create the actual organisational performance. The research was carried out within the research project 2014/13/B/HS4/01618 funded by the National Science Centre, Poland.

## LITERATURE REVIEW

### High Performance Organisation

The beginning of the notion of a high performance organisation might be dated back to the early 1980s. Perhaps the first publication that can be entirely placed within that notion is the work by Peters and Waterman (1982). It describes the behaviours of most successful American companies. Peters and Waterman (1982) discovered that they share a couple of common phenomena: action orientation, being close to the customer, autonomy and entrepreneurship, productivity thanks to employees, strong values, a clear profile of activity, a simple form and low employment and reconciling the contradiction between centralising and decentralising. Moreover, the key aspect that Peters and Waterman (1982) highlight is organisational alignment.

Other significant contributions to the notion that have to be mentioned are by Collins and Porras (1994) and Collins (2001). Collins and Porras (1994) state that there are nine factors that distinguish leaders from other companies: continuity and change, key values

and mobilising goals, stability and non-linearity, 'cult' culture and specific people, consequence and innovations, discipline and creativity, systematic methods and experimental approaches, meaning and achievements, maintaining the core activities and stimulation of growth. The notion of a high performance organisation was later continued by Holbeche (2005), Light (2005), Miller and Le Breton-Miller (2005), Lawler and Worley (2006). For instance, Light (2005) presents the list of four main traits of successful organisations: (1) alertness achieved by thinking in future terms, (2) agility in empowering members of the organisation achieved by supporting communication and organising, (3) adaptation achieved by building freedom in learning and imagination, using all available measures to avoid lack of precision, (4) alignment achieved by leading towards vision and mission.

All of the above considerations are however not methodologically robust, they lack a clear methodological approach. Moreover, the considerations of various authors are not consistent in their approaches, which makes it difficult to compare the results of their research (Peters & Waterman, 1982; Collins & Porras, 1994). The above limitations were taken into consideration by De Waal (2012) who proposed a coherent framework of 35 high performance indicators grouped within five high performance factors that are described below.

'Continuous improvement' includes adopting a strategy that sets the organisation apart from others. Moreover, the organisation makes a constant effort to develop, the organisation's processes are continuously improved, simplified and aligned. For continuous improvement, it is also important that everything that matters to performance is explicitly reported and both financial and non-financial information is reported to organisational members (De Waal, 2012, p. 34). Finally, for continuous improvement it is important to constantly innovate, high performers continuously innovate their competencies, products, processes and services (De Waal, van Nierop, & Sloot, 2017).

'Openness and action orientation' is the factor that stresses the constant drive towards activity and performance (De Waal, 2010, p. 87). For that reason, the whole organisation must be performance-driven. It is based on a frequent dialogue of the management with the employees. Organisational members spend a lot of time on communication, knowledge exchange and learning. Moreover, they are always involved in important processes. Openness and action orientation also require certain style from the management (De Waal & Heijtel, 2017) – managers must allow employees to make mistakes and welcome change.

The style of leadership is more broadly described in the 'management quality' factor. In high performing organisations leaders have integrity, they are role models for organisational members (De Waal, 2012, p. 33). Moreover, they are fast both in decision making and taking a necessary action. Leaders are very effective, but they also focus on achieving results and coach organisational members to do the same. Leaders are also decisive with regard to non-performers (De Waal, van Nierop, & Sloot, 2017). Leadership in high performing organisations is strong, leaders are confident and are trusted by organisational members.

Management quality is also reflected in 'workforce quality' (De Waal & Meingast, 2017). That is achieved by holding organisational members responsible for their results. Management inspires organisational members to accomplish extraordinary results, organisational members are trained to be resilient and flexible and the organisation has diverse and complementary workforce (De Waal & Heijtel, 2017).

Finally, high performing organisations are oriented at being successful in the long run (De Waal, 2012). That is achieved in several ways. High performers maintain good and

long-term relationships with all stakeholders (De Waal & Meingast, 2017). They are aimed at servicing their customers as effectively as possible. The organisation grows through partnerships with suppliers and customers (De Waal, Mroueh, & Schiavo, 2017). Long-term orientation is also achieved by a specific approach to human resource management. It aims at keeping managers and employees in the organisation for a long time which makes it a secure workplace for organisational members (De Waal & Heijtel, 2017). Moreover, new managers are in most cases promoted from within the organisation rather than being hired from the outside (De Waal, van Nierop, & Sloot, 2017).

**Entrepreneurial Orientation**

The base assumption for entrepreneurial orientation scale is that entrepreneurial firms differ from other types of firms (Khandwalla, 1977). They tend to take more risk than other types of firms, proactively search for new business opportunities and have strong emphasis on new product innovation (Khandwalla, 1977; Miller & Friesen, 1982; Mintzberg, 1973). Some researchers operationalised the behaviour of entrepreneurial firms as consisting of product-market innovation, proactiveness of decision making, and risk-taking (Lumpkin & Dess, 1996). They maintained that the level of entrepreneurship presented by a firm is the aggregate total of these three sub-dimensions: 'the extent to which top managers are inclined to take business-related risks (the risk-taking dimension), to favour change and innovation in order to obtain a competitive advantage for their firm (the innovative dimension), and to compete aggressively with other firms (the proactive dimension)' (Covin & Slevin, 1988, p. 218) These scholars also argued that a firm that is truly entrepreneurial should exhibit high levels of each dimension and that entrepreneurial orientation is linked to deeply stored cognitive processes (Palmié, Huerzeler, Grichnik, Keupp, & Gassmann, 2019).

The most widely used operationalisation of the entrepreneurial orientation construct comes from Covin and Slevin (1989), based on Khandwalla (1977) and Miller and Friesen (1982). They stated that innovativeness, proactiveness and risk-taking act together creating uni-dimensional strategic orientation, and should be aggregated together. This assumption and the operationalisation itself proved reliable and valid in many studies, however, later works raised concern pertaining to the dimensionality of the measure and the independence of the sub-dimensions (Dess, Lumpkin, & McGee, 1999; Lumpkin & Dess, 1996; Zahra, 1993). As opposite to the unidimensional measure as constructed by Covin and Slevin (1989), a multi-dimensional measure reflecting each of the sub-dimensions was proposed (e.g. Lumpkin & Dess, 1996). Proponents of the later approach argued that each sub-dimension of the entrepreneurial orientation construct uniquely contributes to the entrepreneurial process. They highlight the potential of each sub-dimension to have a different impact for key outcome variables such as firm performance (Lumpkin & Dess, 2001).

Another important issue concerning entrepreneurial orientation is its validity for research in different countries. Formerly used constructs were developed originally for studies in the United States and then utilised for research in international entrepreneurship without adequately examining their validity. Steensma, Marino, Weaver and Dickson (2000) found that contemporary management theories may not be applicable in all international research contexts due to differences in national culture. Following this concern, Kreiser, Marino, and Weaver (2002) employed a multi-country sample to explore the cross-cultural validity of the entrepreneurial orientation construct. Their study provided strong support for the cross-cultural validity of this scale. Also Luu and Ngo (2019) found

the entrepreneurial construct to be applicable in various cultural contexts, especially in transition economies. Moreover, EO has been successfully applied in various types of organisations, including public enterprises (Tremml, 2019) and also at an individual level (Kollmann, Stöckmann, Meves, & Kensbock, 2017).

## Positive Deviance and its Capacity to Mediate The Relationship Between High Performance Indicators and Entrepreneurial Orientation

Positive deviance is strongly grounded in 'positive' notions of the research: positive psychology and positive organisational scholarship. It has to be said that the expression 'deviance' is negatively attributed, which was highlighted by Dodge (1985). Deviations from norms can, however, be both positive and negative (Warren, 2003). The expression 'positive deviance' was originally used to describe the behaviour that was different from the standard one, contradictory to social norms, however socially desirable (Warren, 2003). In management science, it was used in a metaphorical way, in contrast to medical sciences, especially nutrition science, where the precise conceptualisations of positive deviance had been developed. In a POS perspective, positive deviance is a focus on extremely affirmative phenomena, significant exceptions from the norms to the positive side. It can refer to performance (individual or organisational) and ethical and moral positivity – behaviours that depart from norms but are perceived as positive (Spreitzer & Sonnenshein, 2004).

Positive deviance has not been yet sufficiently conceptualised. It is also used by scholars in rather a loose manner (Vadera, Pratt, & Mishra, 2013), ranging from describing departure from norms (Warren, 2003) to outcomes of certain type of leadership (Cameron, 2008; Williamson, Buchard, Winner, & Winston, 2017). The critical role in conceptualising positive deviance is played by the work by Spreitzer and Sonenshein (2003; 2004). The explanation of positive deviance, its definition and operationalisation open the ground for further scholarly investigations. They claim that positive deviance is linked with meaning, prosocial motivation, self-determination, individual performance and courage and define it as 'intentional behaviour that significantly departs from norms of referent group in a way that is perceived as positive' (Spreitzer & Sonenshein, 2004, 828). Positive scholars are consistent in a view that positive deviance has to be constructed in normative terms – to qualify the behaviour as positively deviant there has to be a group of people that consider that behaviour as positive from the point of view of their value system. There is, however, a problem with defining the point of reference – a social group that will value the behaviour. That problem concerns social groups at various levels of which some may consider the behaviour as positively deviant and other may not consider the behaviour as deviant at all (Kim & Choi, 2018).

Spreitzer and Sonenshein (2003) also consider the contextual factors supporting positive deviance, such as transformational leadership or crisis management. Both seem to have positive influence on positively deviant behaviour. Some scholars also draw attention to possible consequences of positive deviance, such as subjective well-being, quality of relationship between a positive deviant and the recipient(s) of positively deviant behaviour, and individual and organisational performance (Cameron, 2008). Positive deviance plays also a role in changing the social norms (Kim & Choi, 2018). Spreitzer and Sonenshein (2003) state that positively deviant behaviour creates a new norm, and behaviours that were in line with the previous norm begin to be perceived as negatively deviant. This way there is a shift in the norm towards the positive side. As a consequence,

positive deviance has the potential to change not only the internal organisational reality but also external world through the connections of the organisations with stakeholders. It is also important to stress that positive deviance can be collective. Spreitzer and Sonenshein (2003) claim that it can be contagious and transfer from one person to another apart from creating new, more positive norms.

A completely different approach to positive deviance is presented by Cameron (2008) who presents a model of positive deviance with four dimensions: positive climate, positive relations, positive communication, positive meaning. Each of the components is created by certain activities: positive climate by fostering compassion, forgiveness and gratitude, positive relations by building energy networks and supporting strengths, positive communication by obtaining self-feedback and using supportive communication and positive meaning by creating well-being, appealing to personal values, promoting extended influence and building community. Cameron's concept, however interesting, is rather practical and business oriented as it lacks clarity and methodological rigour. Positive deviance has a wide meaning in this approach, it extends to a diversity of positive behaviours at work. However, what is unique in Cameron's concept is drawing attention to the significance of a leader in creating positive deviance.

There is some evidence that positive deviance might be linked to high performance factors. Cameron (2008) states that the process of organising itself is aimed at reducing deviance, therefore it is reasonable to assume that positive deviance will be supported by those of high performance indicators that stress constant change and development as opposite to maintaining status quo and stability. First of all, high performance factor 'continuous improvement' stresses the unique strategy, mission and vision and differentiation from other organisations that, by proxy, is deviant. High performing organisations are even different from others in terms of their perception of the purpose of their existence. Moreover, continuous improvement assumes introducing changes and innovations that also reflect positive deviance. Furthermore, factor 'openness and action orientation' promotes deviance as it stresses the permission to make mistakes and being open to change. Therefore, it can be hypothesised:

**H1:** High performance indicators positively influence positive deviance.

It is also very relevant to ask a question about the impact of positive deviance on organisational entrepreneurship. Intuitively, deviance is at the heart of entrepreneurship as it involves introducing changes, rapid changes in the way of thinking about the market and competition (Covin & Slevin, 1988). Deviance is additionally related to all three dimensions of entrepreneurial orientation: innovativeness, proactiveness and risk taking (Lumpkin & Dess, 2001). Especially innovativeness benefits from positively deviant behaviours, but also proactiveness is about doing things in a new way that is surprising for the competition and gaining competitive advantage this way (DeGraff & Nathan-Roberts, 2012).

The relationship between positive deviance and organisational entrepreneurship and their components has been partly researched before. DeGraff and Nathan-Roberts (2012) claim that positive deviance is the essence of innovativeness. In addition, Nam, Parboteeah, Cullen and Johnson (2014) state that positive deviance is the antecedents of innovativeness. They also argue that some institutions at the country level can moderate that relationship. Kibirango, Munene, Balunywa and Obbo (2017) state that the

relationship between positive deviance and organisational entrepreneurship is mediated by the ecosystem of novelty. Furthermore, Hartman, Wilson and Arnold (2005) link positive deviance to entrepreneurship and prove that two other phenomena are important for the co-existence of those two variables: visionary leadership and structures and actions that support the vision. It is consistent with the presented view that vision is the key to apply positive deviance at the strategic level. Hartman, Wilson and Arnold (2005) also highlight the role that is played by entrepreneurial firms using positive deviance. They state that those companies have a potential to change the rules of market competition and to rebuild the institutions in order to create new, higher ethical norms and better market standards. All of the above allow to hypothesise:

**H2:** Positive deviance positively influences entrepreneurial orientation.

The direct impact of high performance indicators on entrepreneurial orientation has been researched and proven before (Zbierowski, 2012). However, the hypothesised direct effect of high performance factors on positive deviance (Cameron, 2008; De Waal, 2012) and the hypothesised direct effect of positive deviance on entrepreneurial orientation (DeGraff & Nathan-Roberts, 2012; Kibirango, Munene, Balunywa, & Obbo, 2017) lead to formulating the hypothesis on the indirect impact of high performance indicators on organisational entrepreneurship:

**H3:** Positive deviance is the mediator in the relationship between high performance indicators and entrepreneurial orientation.

## MATERIAL AND METHODS

### Research Design, Sample, Variables and Measures, Analytical Techniques

The research was carried out in cross-sectional design on a random and representative sample of 406 Polish enterprises in 2017 and 2018. The research was carried out using the technique of personal interview (CAPI). In each enterprise two people were surveyed: senior manager (owner-manager or a member of the board if possible) and the direct subordinate of that person. Sampling was random and the sample frame was the database of Polish enterprises employing from 50 to 1000 employees. The choice to exclude small and very large enterprises was caused by the nature of the researched relationships. A couple of industries were excluded from the sampling: section A (PKD – Polish Classification of Activity) – farming, forestry, hunting and fishing, section B – mining and extraction of natural resources, section E – water supply, sewage and waste management, recultivation, section O – public administration, national defence, obligatory social security, section Q – healthcare and social support, section T – households employing workers, households producing goods and serving services for their own needs, section U – exterritorial organisations and groups. Organisations in those sections run specific activity that could distort the research results.

To measure high performance factors the measure created by De Waal (2012) was used. Each of the dimensions was measured using three questions. Following Cronbach alpha reliability coefficients were calculated: continuous improvement (0.877), openness and action orientation (0.762), management quality (0.836), workforce quality (0.825), long-term orientation (0.791). Positive deviance was measured using a simplified version of the measure proposed by Spreitzer and Sonenshein (2004). Each of the dimensions was

measured using two items, dimensions were later aggregated to a single measure of positive deviance (0.932). Entrepreneurial orientation was measured using Kreiser, Marino and Weaver (2002) scale with three dimensions: innovativeness (three items, 0.842), proactiveness (three items, 0.834), risk taking (two items, 0.833). For high performance factors and entrepreneurial orientation the confirmatory factor analysis was conducted that confirmed the dimensionality of the constructs.

To test the hypotheses the full mediation modelling was chosen. To test the model further the bootstrapping procedure was used with 200 bootstrap samples and bias-corrected confidence level at 90%. I used structural equations modelling to create and test the model, calculations were performed using SPSS AMOS 25 software. The bootstrapping procedure allows to test the statistical significance of mediated effects.

## RESULTS AND DISCUSSION

The results of the full mediation model are presented in Figure 1 and Tables 1-5.

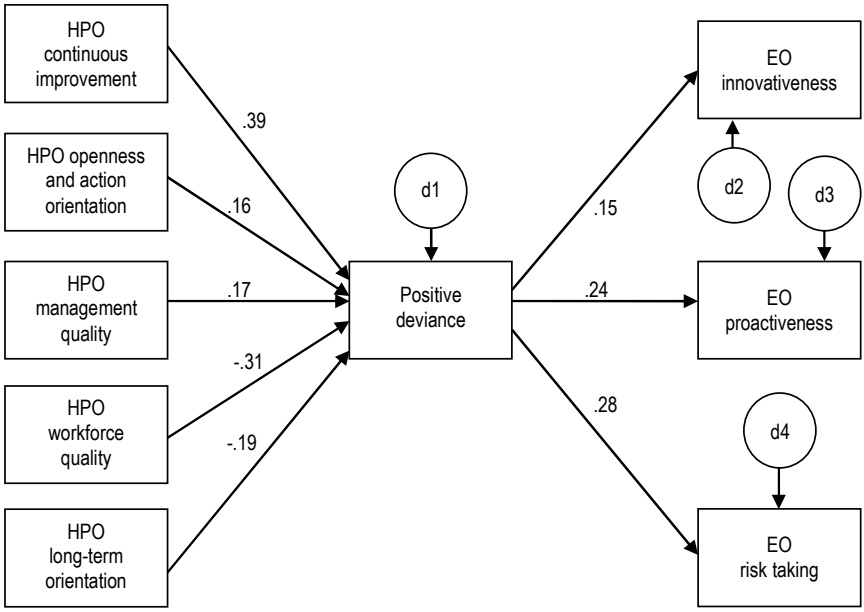


**Figure 1. Mediation model with standardised weights of the effects**
Source: own elaboration.

The results of the mediation analysis indicate the influence of all high performance factors on positive deviance, although the impact has various nature. Continuous improvement, openness and action orientation and management quality influence positive deviance in a positive way, while workforce quality and long-term orientation have a negative impact.

Positive deviance influences all three dimensions of entrepreneurial orientation in a positive way. The influence is a bit weaker for innovativeness and a bit stronger for other two dimensions: proactiveness and risk taking. Table 2 presents the exact standardised regression weights.

**Table 1. Regression weights**

| Variables | | | Estimate | S.E. | C.R. | P |
|---|---|---|---|---|---|---|
| PD | <--- | HPO.LT.orient | -0.298 | 0.064 | -4.687 | *** |
| PD | <--- | HPO.HR.quality | -0.502 | 0.065 | -7.739 | *** |
| PD | <--- | HPO.man.quality | 0.262 | 0.064 | 4.105 | *** |
| PD | <--- | HPO.open.action | 0.244 | 0.060 | 4.046 | *** |
| PD | <--- | HPO.cont.improv | 0.525 | 0.054 | 9.685 | *** |
| EO.proactiveness.lead | <--- | PD | 0.197 | 0.040 | 4.990 | *** |
| EO.innovativeness.lead | <--- | PD | 0.134 | 0.044 | 3.011 | 0.003 |
| EO.risk.taking.lead | <--- | PD | 0.230 | 0.040 | 5.828 | *** |

Source: own study.

**Table 2. Standardised regression weights**

| Variables | | | Estimate |
|---|---|---|---|
| PD | <--- | HPO.LT.orient | -0.189 |
| PD | <--- | HPO.HR.quality | -0.312 |
| PD | <--- | HPO.man.quality | 0.166 |
| PD | <--- | HPO.open.action | 0.163 |
| PD | <--- | HPO.cont.improv | 0.391 |
| EO.proactiveness | <--- | PD | 0.241 |
| EO.innovativeness | <--- | PD | 0.148 |
| EO.risk.taking | <--- | PD | 0.278 |

Source: own study.

The strongest relationships in the model concern the negative impact of workforce quality on positive deviance and the positive impact of continuous improvement on positive deviance. Tables 3-5 present standardised total, direct and indirect effects.

**Table 3. Standardised total effects**

| Variables | HPO.cont.improv | HPO.open.action | HPO.man.quality | HPO.HR.quality | HPO.LT.orient | PD |
|---|---|---|---|---|---|---|
| PD | 0.391 | 0.163 | 0.166 | -0.312 | -0.189 | 0.000 |
| EO.risk.taking | 0.109 | 0.045 | 0.046 | -0.087 | -0.053 | 0.278 |
| EO.innovativeness | 0.058 | 0.024 | 0.025 | -0.046 | -0.028 | 0.148 |
| EO.proactiveness | 0.094 | 0.039 | 0.040 | -0.075 | -0.046 | 0.241 |

Source: own study.

**Table 4. Standardised direct effects**

| Variables | HPO.cont.improv | HPO.open.action | HPO.man.quality | HPO.HR.quality | HPO.LT.orient | PD |
|---|---|---|---|---|---|---|
| PD | 0.391 | 0.163 | 0.166 | -0.312 | -0.189 | 0.000 |
| EO.risk.taking | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.278 |
| EO.innovativeness | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.148 |
| EO.proactiveness | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.241 |

Source: own study.

**Table 5. Standardised indirect effects**

| Variables | HPO.cont.improv | HPO.open.action | HPO.man.quality | HPO.HR.quality | HPO.LT.orient | PD |
|---|---|---|---|---|---|---|
| PD | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| EO.risk.taking | 0.109 | 0.045 | 0.046 | -0.087 | -0.053 | 0.000 |
| EO.innovative-ness | 0.058 | 0.024 | 0.025 | -0.046 | -0.028 | 0.000 |
| EO.proactiveness | 0.094 | 0.039 | 0.040 | -0.075 | -0.046 | 0.000 |

Source: own study.

Because the model does not include any direct and indirect effects of any two variables the total effect of high performance factors on dimensions of entrepreneurial orientation are equal to the indirect effects and total effects of high performance factors on positive deviance and of positive deviance on dimensions of entrepreneurial orientation are equal to the direct effects. The total (and indirect) effects of high performance indicators on entrepreneurial orientation are not very strong, the highest positive effects concern the impact of continuous improvement on risk taking and proactiveness and the strongest negative impact was observed for the influence of workforce quality on risk taking.

The statistical significance of the obtained results was tested by bootstrapping. For this procedure the number of bootstrap samples was 200 and bias-corrected confidence level was set at 90%. The statistical significance was then tested in bias corrected percentile method by comparison of lower bounds and upper bounds in standardised total effects, standardised direct effects and standardised indirect effects. The results are presented in Tables 6-8.

**Table 6. Standardised total effects**

| Variables | HPO.cont.improv | HPO.open.action | HPO.man.quality | HPO.HR.quality | HPO.LT.orient | PD |
|---|---|---|---|---|---|---|
| Lower bounds | | | | | | |
| PD | 0.276 | 0.013 | 0.042 | -0.447 | -0.311 | 0.000 |
| EO.risk.taking | 0.052 | 0.005 | 0.016 | -0.137 | -0.090 | 0.168 |
| EO.innovativeness | 0.012 | 0.006 | 0.006 | -0.081 | -0.060 | 0.033 |
| EO.proactiveness | 0.036 | 0.010 | 0.011 | -0.115 | -0.080 | 0.122 |
| Upper bounds | | | | | | |
| PD | 0.488 | 0.304 | 0.269 | -0.172 | -0.062 | 0.000 |
| EO.risk.taking | 0.170 | 0.090 | 0.086 | -0.046 | -0.015 | 0.371 |
| EO.innovativeness | 0.105 | 0.068 | 0.053 | -0.015 | -0.007 | 0.241 |
| EO.proactiveness | 0.154 | 0.088 | 0.080 | -0.039 | -0.010 | 0.326 |

Source: own study.

The bootstrapping procedure proves that all of the direct, indirect and total effects are statistically significant with the confidence level of 90%. The above results provide partial support for hypothesis H1, full support for hypotheses H2 and H3.

The study revealed the existence of a couple of interesting relationships between the variables. First of all, the impact of high performance indicators on positive deviance is somehow ambiguous. Some of the factors influence positive deviance in a positive way

(continuous improvement, openness and action orientation, management quality) and some in a negative way (workforce quality, long-term orientation). To explain that the content of those factors should be investigated. Factor 'continuous improvement' concerns mainly improving processes and introducing innovations. This definitely supports positive deviance as it involves constant change. Moreover, the strategy of high performers puts stress on differentiation, therefore any deviant approaches are promoted as they are not likely to be manifested by competitors. Factor 'openness and action orientation' includes allowing employees to make mistakes and welcoming change by the firm's management. Both indicators are important for positive deviance. Positively deviant behaviours might be risky as the outcomes are difficult to predict. Therefore, being open to change and allowing to make mistakes promotes positively deviant behaviours. Also spending a lot of time on dialogue and knowledge exchange helps to build the climate of trust, where positively deviant behaviours are more likely to be expressed. Factor 'management quality' also stresses the role of trust, moreover, it highlights being a role model by the manager and fast decision making and acting. Those factors also contribute to positive deviance by creating a dynamic, yet secure environment.

**Table 7. Standardised direct effects**

| Variables | HPO.cont.improv | HPO.open.action | HPO.man.quality | HPO.HR.quality | HPO.LT.orient | PD |
|---|---|---|---|---|---|---|
| Lower bounds | | | | | | |
| PD | 0.276 | 0.013 | 0.042 | -0.447 | -0.0311 | 0.000 |
| EO.risk.taking | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.168 |
| EO.innovativeness | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.033 |
| EO.proactiveness | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.122 |
| Upper bounds | | | | | | |
| PD | 0.488 | 0.304 | 0.269 | -0.172 | -0.062 | 0.000 |
| EO.risk.taking | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.371 |
| EO.innovativeness | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.241 |
| EO.proactiveness | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.326 |

Source: own study.

**Table 8. Standardised indirect effects**

| Variables | HPO.cont.improv | HPO.open.action | HPO.man.quality | HPO.HR.quality | HPO.LT.orient | PD |
|---|---|---|---|---|---|---|
| Lower bounds | | | | | | |
| PD | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| EO.risk.taking | 0.052 | 0.005 | 0.016 | -0.137 | -0.090 | 0.000 |
| EO.innovativeness | 0.012 | 0.006 | 0.006 | -0.081 | -0.060 | 0.000 |
| EO.proactiveness | 0.036 | 0.010 | 0.011 | -0.115 | -0.080 | 0.000 |
| Upper bounds | | | | | | |
| PD | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| EO.risk.taking | 0.170 | 0.090 | 0.086 | -0.046 | -0.015 | 0.000 |
| EO.innovativeness | 0.105 | 0.068 | 0.053 | -0.015 | -0.007 | 0.000 |
| EO.proactiveness | 0.154 | 0.088 | 0.080 | -0.039 | -0.010 | 0.000 |

Source: own study.

The negative impact of two of high performance factors on positive deviance is somehow unexpected. However, a closer look at the content of two high performance factors helps to uncover the meaning of the relationship. In 'workforce quality' the stress is put on taking responsibility by employees and being resilient. This promotes rather a static view of organisational activities and does not support positive deviance very well. Similarly, for 'long-term orientation' it is critical that the organisation maintains good relationships with the stakeholders and that the organisation is a secure workplace (including keeping employees for a long time and internal selection of managers). I argue that good relationships with the stakeholders are based on predictability that contradicts positive deviance. Also job security is not well suited with positively deviant behaviours.

As predicted, positive deviance positively influences all three dimensions of entrepreneurial orientation. However, rather unexpectedly, it has the weakest influence on innovativeness, which relationship is most evidenced in the literature. The impact of positive deviance on proactiveness and risk taking is less documented but the conducted research shows that it is stronger. Positively deviant behaviours might be surprising for competitors, they constitute new ways of thinking not known to other companies. Therefore, proactiveness may have its source in them. Positively deviant behaviours are also risky as they may require the allocation of resources and the final result is rather difficult to predict. Therefore, positive deviance results in higher risk.

The study revealed a general indirect effect of high performance factors on dimensions of entrepreneurial orientation with the mediation of positive deviance. All of the mediated relationships are statistically significant, however, all of them are rather weak. However, some of them are worth discussing. The strongest positive impact (0.109) is by 'continuous improvement' on risk taking. Similarly to positive deviance, constant improvement involves taking decisions on the allocation of resources that are risky and new solutions are not guaranteed to be successful. 'Continuous improvement' has also a positive impact on proactiveness (0.094). Introducing changes leads to gaining competitive advantage not necessarily by product innovation but also by improving, simplifying and aligning processes.

The strongest negative indirect impact of high performance factors on entrepreneurial orientation dimensions was observed for 'workforce quality' and risk taking (-0.087) and proactiveness (-0.075). Both relationships are caused by stability and security that are promoted in that high performance factor. They prevent both taking risk and proactive behaviours of employees and the whole organisation. To sum up, the influence of high performance factors on entrepreneurial orientation is mixed with the slight dominance of the positive impact.

## CONCLUSIONS

The research on positive deviance is growing especially in relation to leadership and teamwork (Cameron, 2008; Williamson, Buchard, Winner, & Winston, 2017; Kim & Choi, 2018). The present study contributes to this line of literature by pointing to the role of positive deviance in mediating between operational strategies employed by companies and outcomes, such as entrepreneurial orientation that leads to higher performance (Lumpkin & Dess, 1996). The contribution is especially relevant in considering the organisation-level effects of positive deviance, contrary to the effect at the team level, most commonly investigated recently (Williamson, Buchard, Winner, & Winston, 2017; Kim & Choi, 2018).

Another contribution is the discovery of ambiguities regarding the outcomes of high performance indicators. Until now, all of them have been presented as resulting in positive consequences and higher performance (De Waal, 2012). The results contradict that view and point to some possible negative outcomes of being driven by high performance. Moreover, it seems that the construct of high performance indicators is internally contradictory and demands agility to be properly implemented.

The study also contributes to the stream of research on entrepreneurial orientation at organisational level, and more broadly to research on organisational entrepreneurship, corporate entrepreneurship and intrapreneurship. The results contribute especially to research on cognition and behaviours related to entrepreneurial orientation (Palmié *et al.*, 2019) by pointing to some effects of positively deviant cognitive and behavioural processes on entrepreneurial orientation. Furthermore, the present study is relevant for the configuration of high performance features and entrepreneurial orientation in some specific types of organisations, such as public enterprises (Tremml, 2019). The results of the study are especially relevant for developing and transition economies (Luu & Ngo, 2019).

Finally, the study contributes to the development of research stream of high performance organisation attributes (De Waal, 2010; De Waal, 2012; De Waal, van Nierop, & Sloot, 2017; De Waal & Heijtel, 2017; De Waal & Meingast, 2017; De Waal, Mroueh, & Schiavo, 2017), especially by at least partly explaining how high performance characteristics drive entrepreneurial orientation, and ultimately, high performance.

The key recipients of the results of the study are CEOs and senior managers involved in day-to-day running of businesses. In their interest is the enhancement of entrepreneurial orientation as a tool to gain competitive advantage and high performance (Lumpkin & Dess, 1996). There are a couple of practical recommendations that can be drawn from the results of the study. First of all, positive deviance is a good way of supporting entrepreneurial orientation. Therefore, companies that are in pursuit of higher organisational entrepreneurship can use it as a good way of supporting it. It concerns all aspects of entrepreneurial orientation, especially proactiveness. By promoting non-standard behaviours companies can therefore surprise customers and gain first-mover advantage. Another practical recommendation concerns shaping the high performance factors to support both positive deviance and organisational entrepreneurship. It seems that some of them should be maximised, like constant improvement, creating extraordinary vision, mission and strategy, allowing to make mistakes, welcoming change, fast decision making and action and integral, strong and confident leadership. All of the above behaviours support positive deviance and, in consequence, organisational entrepreneurship. By contrast, organisations should be careful with using some other high performance indicators grouped in factors 'workforce quality' and 'long-term orientation'. It seems that those factors introduce high level of stability that can be harmful to positively deviant behaviours. The answer to that might be the reconciliation of contradiction between stability and flexibility, organisations should make the environment as friendly to employees and at the same time encourage them to be flexible.

Apart from CEOs and senior managers the stakeholders of the present study results are employees. Positive deviance is associated with a wide range of other positive behaviours, such as taking charge, creative performance, expressing voice, whistle-blowing, extra-role behaviours, prosocial behaviors, prosocial rule breaking, counter-role behaviours, and issue selling (Vadera, Pratt, & Mishra, 2013). Therefore, promoting positive deviance

by using high performance characteristics will lead not only to higher levels of entrepreneurial orientation but also to positive workplace actions that ultimately lead to higher satisfaction and well-being (Weinstein & Ryan, 2010).

There are some limitations to the study. One of them is of conceptual nature: the proposed model does not include any direct relationships between high performance indicators and dimensions of entrepreneurial orientation. The reason for that is twofold. First, that relationship has been researched before (Zbierowski, 2012) and second, including direct relationships would blur the model by adding 15 additional effects which would make the framework difficult to comprehend and interpret. However, as a result of that, it is impossible to predict if indirect relationships are stronger than direct ones and therefore if the relationship is fully or only partially mediated. The other limitation is the sample that is homogeneous in terms of nationality which might make the results country specific and difficult to generalise. Therefore, future empirical investigations in that notion could take into consideration larger, international samples and/or replicating the research. Moreover, in spite of the question about 'how' high performance indicators work there is still space to investigate possible mediators in the relationships between them and their outcomes.

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**Author**

**Przemysław Zbierowski**

Associate Professor at the Department of Human Resource Management, Faculty of Management, University of Economics in Katowice. Research focus: entrepreneurship, psychology of entrepreneurship, positive organizational behaviour.

**Correspondence to:** Prof. UE, dr hab. Przemysław Zbierowski, University of Economics in Katowice, Department of Human Resources Management, ul. Bogucicka 3a (Building B, office 412), 40-226 Katowice, Poland, e-mail: przemyslaw.zbierowski@ue.katowice.pl

**ORCID** http://orcid.org/0000-0001-6144-1940

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# Comparative International Entrepreneurship: Theoretical Framework and Research Development

**Agnieszka Głodowska**

**ABSTRACT**

**Objective:** The aim of the article is to recognise the scientific identity of comparative international entrepreneurship (CIE) and to review the literature on this problem in the perspective of international entrepreneurship (IE).

**Research Design & Methods:** The applied research method is the analysis of theoretical and empirical articles on comparative international entrepreneurship published in the years 1989-2018. On this basis, the Author formulates propositions of problems suitable for the scientific exploration in the future in the stream of comparative research.

**Findings:** Comparative international entrepreneurship is one of three research domains of international entrepreneurship. We can identify here a few important problems for future research, which concern institutional and cultural conditionings of entrepreneurship, the operationalisation of entrepreneurship and the assessment of the effects of entrepreneurship for the economic growth and development.

**Implications & Recommendations:** It is recommended to conduct theoretical and empirical in-depth research into international entrepreneurship in the comparative approach. It is of great cognitive importance for the development of the discipline and of utilitarian importance both for entrepreneurs – the micro level and economic decision-makers – the macro level.

**Contribution & Value Added:** The article fills a research gap related to the conceptual embedment of comparative international entrepreneurship and is one of the first articles to review the literature concerning this problem.

**Article type:** conceptual article

**Keywords:** comparative international entrepreneurship; international entrepreneurship; comparative research; international comparison; entrepreneurial internationalisation

**JEL codes:** L26, O57, P52

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## INTRODUCTION

Comparative international entrepreneurship (CIE) is one of three research domains of international entrepreneurship (IE), in addition to entrepreneurial internationalisation and comparisons of entrepreneurial internationalisation. International entrepreneurship is a relatively new research area which was initiated by the end of 1980s, and its real development took place a decade later (Wach, 2018). It is understood as discovering, enacting, assessing and using opportunities beyond state borders in order to create future goods and services. International entrepreneurship includes both research into entrepreneurship in the sense of internationalisation and international comparisons of domestic entrepreneurship in many countries (McDougall & Oviatt, 2005). The problem most often discussed in its stream is entrepreneurial internationalisation (McDougall & Oviat, 1994; Jones & Coviello, 2004; Cavusgil & Knight, 2015; Autio, 2018). International entrepreneurship is mainly associated with the internationalisation process. The other two research areas: comparative international entrepreneurship and comparisons of entrepreneurial internationalisation are less recognized or completely disregarded in international literature. On the other hand, growing interest in domestic entrepreneurship has been visible for a few years (Coviello, McDougall, & Oviatt, 2011 Beynon, Jones, & Pickernell, 2018), which may be the contribution to the development of international research in this direction. Therefore, conceptual embedment of this type of research in theory, as well as the summary of the existing output are worth considering. The validity of combining comparative research and international entrepreneurship was already articulated in its first definitions (McDougall & Oviatt, 2000; 2003; 2005).

The aim of the article is to recognise the affinity and scientific identity of the comparisons of international entrepreneurship and to make the systematic literature review in this area. Through the realisation of the aim thus defined it is possible to formulate propositions of problems recommended for the development of comparative research into international entrepreneurship. Due to the character of the article, research methods applied in the work are the analysis of the content of theoretical and empirical publications in the area of international entrepreneurship in the years 1989-2018.

The article is divided into interrelated sections. First section describes the applied research methods, the scope of research and sources of information. Second section presents the review of literature, based on which thematic areas for further research were identified. In the third section a discussion is conducted on the indicated research areas.

## MATERIAL AND METHODS

The aim of the article is the recognition of the scientific identity and conceptual embedment in research problems of comparative international entrepreneurship. Moreover, the article attempts to sum up the existing scientific output in comparative research on international entrepreneurship. The approach provides a firm theoretical framework for future research into comparative entrepreneurship in the comparative approach, through proposing research problems which can be developed in future empirical studies. The main research method used in the article is a critical analysis of literature on international entrepreneurship and its synthesis. In the first place, the scientific affinity of comparative

international entrepreneurship is recognized. Then, attention is paid to the scientific identity of this research area. In the next part of the article there is a literature review in the search for an answer to the question about the theoretical bases of international comparative research into entrepreneurship. Finally, the quantitative and qualitative analysis of the existing output on comparative international entrepreneurship is conducted.

The bibliometric analysis was conducted based on renowned, international bases of publishers: Emerald Insight, Jstor, Science Direct, Springer, Willey Online Library. In addition, the abstract and citation base Scopus was used. The choice of the above sources arose from their position in international rankings of such centres as: Australian Political Studies Association (APSA), Socio – Economic and Natural Sciences of the Environment (SENSE), Centre for Resource Studies for Human Development (CERES). The adopted period for the analysis are the years 1989-2018. The adoption of this research period resulted from two assumptions: 1) the assumption concerns the year 1989, which is related to the period of the initiation of research into international entrepreneurship. It was then when the ground-breaking publication by McDougall (1989) on domestic and international ventures was published 2) the assumption concerns the year 2018, which was chosen as the final year to present the most current state of knowledge on international entrepreneurship in the comparative approach.

## LITERATURE REVIEW AND THEORY DEVELOPMENT

### The Affiliation and Scientific Identity of Comparative International Entrepreneurship

Comparative international entrepreneurship belongs to the stream of research into international entrepreneurship. International entrepreneurship is a relatively young research area, developed within research combining entrepreneurship and international business (Wach, 2018). According to McDougall and Oviatt (1994), Knight and Cavusgil (2004), and Perényi and Lansocz (2018), it can aspire to be called an independent scientific discipline. According to the first definitions, international entrepreneurship is understood as the development of new ventures or start-ups which from the very beginning engage in international activity and thus perceive their international activities from their inception (McDougall, 1989). In the course of deepening the research into international entrepreneurship, the Author reviewed her conceptual approach indicating that in addition to innovative, proactive and risky behaviours, research into international entrepreneurship includes also comparative research into entrepreneurial behaviours in numerous countries, thus emphasizing the comparative dimension in the perspective of international entrepreneurship (McDougall & Oviatt, 2000). The final legitimisation of comparative research within international entrepreneurship was made by Jones, Coviello and Tang (2011), who, based on 232 scientific publications, made the typisation of the research areas of international entrepreneurship mentioning three research domains defined as research types:

- Type A: Entrepreneurial internationalisation.
- Type B: International comparisons of entrepreneurship (countries and cultures).
- Type C: Comparative entrepreneurial internationalisation.

According to Table 1, we can identify comparative research within international entrepreneurship research in two ways. Firstly, we can indicate that there are two fundamental research problems in entrepreneurship: 1) internationalisation, 2) comparative

research. Then, we can divide comparative research into comparative research on domestic entrepreneurship and comparative research on entrepreneurial internationalisation. Secondly, each of these subjects can be indicated separately, namely: 1) entrepreneurial internationalisation, 2) comparative research on entrepreneurship, 3) comparative research on entrepreneurial internationalisation.

**Table 1. Research domains of international entrepreneurship according to Jones, Coviello and Tang (2011)**

| Type | Domain | Research problems |
|---|---|---|
| Type A | Entrepreneurial Internationalisation | - Venture type<br>- Internationalisation<br>- Networks & Social Capital<br>- Organisational Issues<br>- Entrepreneurship |
| Type B | International Comparisons of Entrepreneurship | - Cross-country Research<br>- Cross-culture Research<br>- Combined Cross-country & Cross-culture |
| Type C | Comparative Entrepreneurial Internationalisation | - Venture Type<br>- Internationalisation Patterns & Process<br>- Internationalisation Influences<br>- Organisational Issues |

Source: adopted from Jones, Coviello and Tang (2011, p. 636).

Chronologically, it is claimed that the first research area of international entrepreneurship was internationalisation, then international comparisons of entrepreneurship and comparative entrepreneurial internationalisation (Jones, Coviello, & Tanga, 2011; Allen, 2016; Hofman-Kohlmeyer, 2018). In the years 1989-1996, the main subject of research was entrepreneurial internationalisation, and first of all the explanation why, when and how firms engage in international business. From 1990, research into comparative international entrepreneurship was initiated. It concerned the assessment of the entrepreneurship level in different countries, cultural differences, or combining the indicated issues. This research area developed especially till 2002. Then, from 2001 attention was paid to comparing the internationalisation process in different countries. It basically concerned types of international ventures and internationalisation patterns (Jones, Coviello, & Tanga, 2011; Allen, 2016; Hofman-Kohlmeyer, 2018).

The scientific identification of comparative research on international entrepreneurship is strictly related to determining the legitimisation of the scientific independence of international entrepreneurship itself. There is no consistent approach to it. Doubts concerning the scientific identity of international entrepreneurship arise from the fragmentary character and the inconsistent application of terms, concepts, paradigms and theoretical constructs (Keupp & Gassman, 2009). Moreover, Coviello and Jones (2004) question the methodology of research in this stream. There is no balance between exploratory and explicative studies. It all points to scientific immaturity of international entrepreneurship. On the other hand, in recent years a very dynamic development of research into international entrepreneurship has been visible, which brought about the occurrence of scientific journals strictly related to this research domain. A great number of publications, monographs come out. International

conferences are organised, and majors with its name are introduced at universities. It all indicates the delimitation between international entrepreneurship and other scientific disciplines, thus meaning its scientific independence. There are also premises enabling to question the accusation of the lack of theoretical bases identifying international entrepreneurship. International entrepreneurship derives from the internationalisation theory (Kraśnicka, 2012; Wach, 2018), however, distinguishing entrepreneurial internationalisation from other internationalisation forms arises from the cognitive approach (Jones & Coviello, 2004; Etemad, 2018). Moreover, the contribution of entrepreneurship, and, to be more exact, classical and neoclassical concepts of entrepreneurship discussed in economics, the Austrian school and entrepreneurial orientation is also important. Within international entrepreneurship entrepreneurial mechanisms arising from entrepreneurship theory are discussed at the international level, therefore the scope changes from the domestic to the international one (Daszkiewicz, 2014). Theoretical bases for international entrepreneurship create the conceptual framework for comparative research. The institutional approach is of special significance here, and it is considered in the majority of papers on international entrepreneurship (Zucchella & Magniani, 2016). Moreover, the theoretical framework for comparative research into entrepreneurship set international business concepts, e.g. transaction cost theory (Brouthers & Nakos, 2004). Also, we cannot skip the resource-based theory and economic entrepreneurship concepts (van Stel, Carree, & Thurik, 2005).

From those two different perspectives of perceiving international entrepreneurship in the scientific space the need for an interdisciplinary but holistic approach to the theoretical framework and the methodology of research into international entrepreneurship arises, which should be treated as a natural process of the formation of a new scientific discipline (Jones & Coviello, 2011).

***Proposition 1:*** Comparative international entrepreneurship should be developed as one of research domains of international entrepreneurship, which is at the stage of formation as an independent scientific discipline.

**Comparative International Entrepreneurship in Prior Research**

The analysis of the existing output on international comparisons of entrepreneurship boils down to the search for papers according to the adopted key words 'comparative international entrepreneurship'. In the first place, the bibliometric analysis was presented, and then the analysis of the content was made. The results of the search for publications in the bases of publishers according to the applied key words were similar: Emerald Insight (*n*=7,338), Jstor (*n*=4,784), Science Direct (*n*=5,252), Springer (*n*=14,521), Willey Online Library (*n*=14,803). The biggest number of publications on international comparisons of entrepreneurship was published by Springer and Wiley Online Library. In total, in the period of the analysed almost 30 years 30 thousand publications were identified which included the key words 'Comparative international entrepreneurship'. We should remember that the statistics include a great variety of scientific disciplines and research areas. Every publisher autonomously defines the thematic scope and nomenclature, therefore, the identification is not identical: Emerald Insight (strategic management, entrepreneurship, education, human resources, international business, economics), Jstor (business, economics, management and organisational behaviours, developmental research), Springer (business and management,

economics, international relations, political relations, education), Wiley Online Library (management and business, economics, developmental research, accounting).

Based on the number of the publications brought out, the real development of comparative research on entrepreneurship has been visible since 2005. Therefore, we can claim that it is a very young research area, in fact developing for a few years. It is a problem relatively poorly recognized in economic literature, as well as the literature on entrepreneurship and international business (Figure 1). In the Polish literature the subject is practically absent.

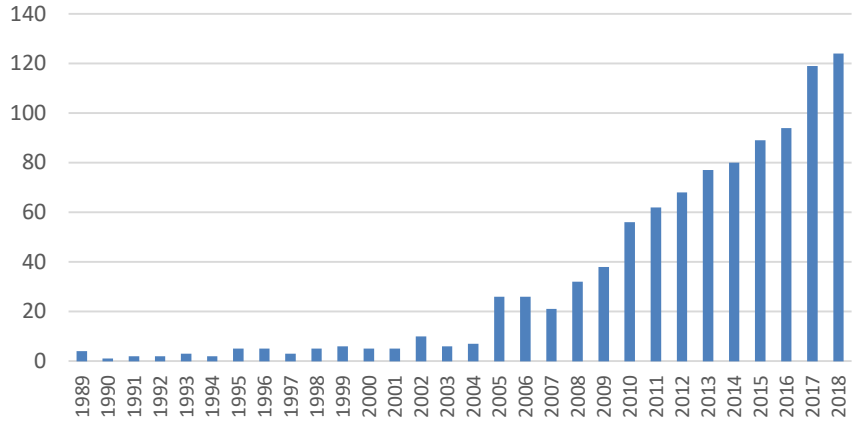


**Figure 1. The number of publications including the key words "Comparative International Entrepreneurship" in Scopus in the years 1989-2018**
Source: own study based on Scopus.

In the Scopus base in the years 1989-2018, 185 publications were recognized including the phrase 'Comparative International Entrepreneurship'. In the first years there were single papers on that. A visible increase in the studies took place after 2005. A great increase in the publications in this research area has been visible since 2009, and its dynamics in recent years indicates its great potential for future research. The most popular key words which were identified with the searched phrase were: international entrepreneurship, entrepreneurship, entrepreneur, international comparisons. The prevailing form of publications are scientific articles (*n*=125), books (*n*=16), conference materials (*n*=18), chapters in monographs (*n*=25), whose authors are usually researchers from the US, Great Britain and Canada.

The article by Jones, Coviello and Tang (2011) can be regarded a ground-breaking paper on comparative international entrepreneurship. The publication indicates research domains entering the area of research related to international entrepreneurship. Over the period of eight years, the article was cited over 400 times. Another popular paper is the work by Thomas and Mueller (2000) on the influence of culture of entrepreneurship in the comparative approach. An important publication on comparative international entrepreneurship, which is the first and so far the only review of the research into this (Systematic Review) is the paper by Terjesen, Hessels and Li (2013). The work based on the query of literature from the period 1989-2010 from 21 top scientific journals sumps up the output of international comparative research ordering it according to four levels: 1) individual entities, 2) firms – micro, 3) industries – meso, 4) countries – macro. The research on the bases of individuals

concerns the characteristics and definition of the properties of individuals – entrepreneurs: gender, education, social capital, psychological attributes, entrepreneurial orientation (Terjesen, Hessels, & Li, 2013). Studies concerning firms are most numerous and concern internationalisation, comparisons of firms, business models, entrepreneurial orientation, resources and effects of entrepreneurship on the micro level (Terjesen, Hessels, & Li, 2013). Comparative research on industries is, on the other hand, the lowest percentage of papers. It concerns small and medium-sized enterprises, enterprises of increased risk, the informal sector (Terjesen, Hessels, & Li, 2013). One-fourth of comparative research on entrepreneurship concerns the macro-level. These are papers discussing the subject of the determinants of domestic entrepreneurship and its effects. Entrepreneurship is perceived as a stimulant of growth and economic development (Terjesen, Hessels, & Li, 2013).

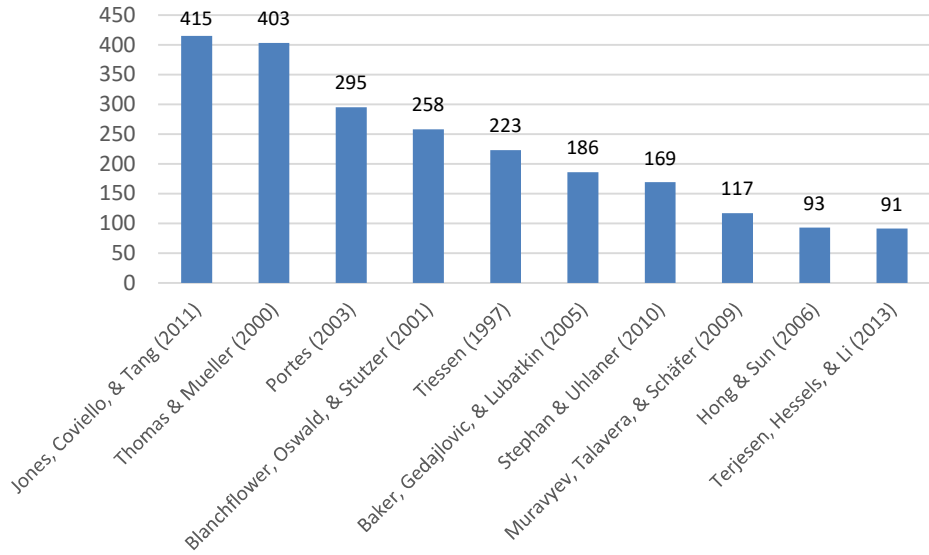


**Figure 2. Most frequently cited publications on comparative international entrepreneurship in Scopus in the years 1989-2018**
Source: own study based on Scopus.

The analysis of the content of publications on comparative international entrepreneurship allows to notice some issues which seem to be particularly important in the area of comparative research on international entrepreneurship. In the initial years of the interest in this domain, the problems of culture and institutional conditionings of entrepreneurship in the comparative approach were discussed. Based on the institutional theory, the creation and formation of entrepreneurship were analysed. The subjects are still being developed (Richet, 1993; Chang & Kozul-Wright, 1994; Kshetri, 2009). Nowadays, research is undertaken into institutional, financial, human or logistical infrastructure in the context of entrepreneurship and mutual relationships between these categories (Manolova, Brush, Edelman, Robb, & Welter, 2017). It is a very important issue to understand entrepreneurial capabilities, recognition and use of opportunities of different economies and societies. The re-

search points to the feedback-type relation between the institutional environment and entrepreneurship. Particularly important is research into the influence of institutional conditionings on small and medium-sized enterprises (Acs, Morck, & Yeung, 2001; Stephan & Uhlaner, 2010). Similar research was conducted from the point of view of cultural conditionings (Holt, 1997; Tiessen, 1997; Thomas, Mueller, & Jaeger, 2002; Lombardi, Lardo, Cuozzo, & Treguattrini, 2017). The influence of different cultures on the level of entrepreneurship and various entrepreneurial qualities were verified (Thomas & Mueller, 2000).

***Proposition 2:*** The papers realised within international comparative research on entrepreneurship showed the co-dependence of institutional and cultural conditionings and entrepreneurship in different countries.

An important problem recognized in international comparative research is the domestic entrepreneurship measurement. There are more and more publications on the measurement of domestic entrepreneurship and its international comparisons, in which authors try to create authorial entrepreneurship measures on the macro-level. So far, the most popular measure created within works by the representatives of Bobson College and London Business School is Global Entrepreneurship Monitor (GEM). The report includes a great variety of aspects related to entrepreneurship in the international dimension: measuring entrepreneurial activity in countries, identifying factors determining the entrepreneurship level of economies (Àlvarez, Urbano, & Amorós 2014). Another measure applied to determine entrepreneurship at a country level is the proposition of the World Bank – the World Bank Group Entrepreneurship Survey (WBGES). In the research the benchmark of the economic activity in the group of developed and developing countries is sought in order to build a database on the typology and characteristics of international business activity based on data obtained directly from institutions registering business activity in different countries (Ács, Desai, & Klapper, 2008). An alternative approach to the measurement of the entrepreneurship of countries was proposed within the collaboration of the European Statistical Office (Eurostat) with the Organization for Economic Cooperation and Development (OECD) in the Entrepreneurship Indicator Programme (EIP) programme. As a result, a database was developed to conduct comparative research on entrepreneurship in three dimensions (Eurostat, 2018): 1) conditionings of entrepreneurship, 2) results of entrepreneurship, 3) effects of entrepreneurship. Attempts to operationalise domestic entrepreneurship for the needs of international comparative research can be also found in works by van Stel (2006), Ács, Szerb and Autio (2014).

***Proposition 3:*** One of the key research problems recognized within comparative international entrepreneurship is the operationalisation of domestic entrepreneurship – that is, at the macro-level.

Conducting research into the operationalisation of a country's entrepreneurship for the needs of international comparisons has a cognitive and utilitarian value. It can be a starting point to carry out in-depth research into changes, development, dynamics and causative factors of entrepreneurship of different countries, the identification of disproportions between economies and the sources of their occurrence. It can be also used to assess the effects of entrepreneurship of different countries. It concerns the recognition of the significance of entrepreneurship for economic growth, development and human welfare. Not only in the economic but also in the behavioural sense entrepreneurship is

related to the search for and implementation of new forms of development and a change in the social status by active individuals, societies and nations (Klonowska – Matynia & Palinkiewicz, 2013). Focus on the effects of entrepreneurship which are positive for economy, and the purposefulness of entrepreneurial activities can be seen in works of international institutions and organisations (OECD, 2008; 2017; European Commission, 2018). In the majority of studies, the positive impact of entrepreneurship on economic growth is confirmed (Audretsch, 2007; Baumol & Strom, 2007; Ács, Audretsch, Braunerhjelm, & Carlsson, 2009; Olaison & Sorensen 2014). According to the research by Sternberg and Wnnekers (2005), the impact of entrepreneurship on economic development is evident and depends on the level of development of a given economy. It is also confirmed in other papers (Valliere & Peterson, 2009; Ferreira, Fayolle, Fernandes, & Raposo, 2017).

***Proposition 4:*** Comparative international entrepreneurship in the context of the assessment of the effects of entrepreneurship has shown the relationship between the level of entrepreneurship of a country and its economic growth.

## DISCUSSION

Based on the analysis of the content of papers created so far on comparative international entrepreneurship, we can claim that it is a very prospective research area with high potential for future research. The problem is not recognized properly and there are a lot of opportunities to conduct research in the stream of international entrepreneurship. Recently, a lot of pressure is put on the need to develop research concerning the Central and Eastern Europe region (Andersson, Evers, & Kuivalainen, 2014; Terjesen, Hessels, & Li, 2013; Perényi & Losoncz, 2018). In fact, there are papers undertaking the problem of the influence of the political transformation in central and Eastern Europe on entrepreneurship (Richet, 1993) or on forms of business activity in post-socialist economies (Kshetri, 2009), but conducting research on entrepreneurial processes taking place in that region is still desirable.

There is a very clear space of scientific exploration in the area of international comparisons of cultural conditionings of entrepreneurship. Holt (2017) attempted to compare two contrasting societies in terms of culture in order to verify the impact of Chinese and American cultures on entrepreneurship. The research findings proved obvious differences but also some similarities of the studied societies. According to the author, cultural differences result from Confucian influences in China. On the other hand, similarities arise from the progressing globalisation. Similar findings are presented by Tiessen (1997) on the example of American and Japanese societies. Verification of the impact of culture on entrepreneurship may concern various areas. At present, the problem is still very important, especially comparative research may focus on associating culture with entrepreneurial processes, immigrant entrepreneurship and education for entrepreneurship (Lombardi, Lardo, Cuozzo, & Treguattrini, 2017).

It is necessary to search further for an appropriate measure of a country's entrepreneurship for international comparisons. Empirical research often boils down to the selection of one representative entrepreneurship indicator, such as: the number of newly-established firms, the saturation with firms, survival of businesses, firms' growth dynamics, the percentage of the self-employed (Valdez & Richardson, 2013; Canever & Menezes, 2017; Dvouletý, 2017). There is a need to build a measure which would consider all dimensions of

entrepreneurship. Among the presented aggregated measures, the most popular one is the GEM approach. It is based on institutional bases of entrepreneurship, which does not show the multidimensionality of the category which a country's entrepreneurship is. Institutions and the institutional environment are very important for entrepreneurship, but we cannot also skip the behavioural, economic, sociological and psychological approaches. GEM Monitor is too focused on the aspect of creating new businesses, leaving aside the assessment of the permanence of ventures (Audritsch, 2003; Hindle, 2010). In spite of those limitations, GEM indices have a substantial informative value. Research in this direction is worth continuing, which is necessary for the intensification of research into entrepreneurship in relation to other areas of socio-economic life. It is particularly important to recognize the impact of entrepreneurship on the condition of economy and inducing its economic growth. Declaratively, the European Commission (2018) indicates that economic growth in Europe and employment depend on the development of enterprises. Entrepreneurship stands for new firms, new markets and new opportunities. Encouragement for entrepreneurship, establishing firms, promotion of small and medium-sized enterprises are the key objectives of the EU activities. On the other hand, the World Bank (2013) regards innovations and entrepreneurship as the fundamental factors of a competitive and dynamic economy. Countries and regions characterised by innovativeness and entrepreneurship are characterised by higher productivity, which, as a result, leads to an increase in employment and then to economic growth and welfare of citizens. However, empirical research does not provide uniform results in this area, which may be an impulse for conducting in-depth research in this issue (Sternberg & Wennekers, 2005; Valliere & Peterson, 2009; van Stel, Thurik, Stam, & Hartog, 2010; Ferreira, Fayolle, Fernandes, & Raposo, 2017).

Other research problems which may be recommended for further research in the area of international entrepreneurship in the comparative approach are: entrepreneurship of women, entrepreneurial orientation, social entrepreneurship and comparison of entrepreneurial internationalisation.

## CONCLUSIONS

International comparisons of entrepreneurship are one of three research domains of international entrepreneurship. It is a relatively new research area, which has been developing since 1980s. Comparative research within international entrepreneurship is not, however, popularised in empirical research, and entrepreneurship itself is first of all associated with internationalisation. Comparative international entrepreneurship is part of the research into international entrepreneurship, which arises from its theoretical bases. For a few years, growing interest in international entrepreneurship in the comparative approach has been observed, which can be understood as a kind of a future, emerging trend of research. Based on the analysis of the content of existing papers we can claim that this direction of research will be developed and has a lot of potential. We can identify a few important problems for empirical verification, which concern institutional and cultural conditionings of entrepreneurship, operationalisation of entrepreneurship, and the assessment of the effects of entrepreneurship for economic growth and development.

This article can be treated as an initial study on the comparative research in international entrepreneurship. However, it has some limitations, which can be seen at the same time as recommendations for future research. Undoubtedly, there is a need to

conduct in-depth theoretical and empirical research in this stream. An important limitation in this article is the lack of application of more advanced research tools for the analysis of the content. It is recommended to apply appropriate software dedicated strictly to bibliometric analysis that allows for in-depth analysis. On this basis the bibliographic relations recognition would be possible. In addition, it is worth to take into account a larger range of available databases. The limitation of the study may also seem to be the recognition of only research trends without indicating the links between them, which should definitely be examined in the future.

Theoretical studies are desired, which would verify the scientific identity of international entrepreneurship, thus, international comparative research into entrepreneurship. What also seems to be important are systematic papers of literature review. To date, there is practically only one such a paper on comparative international entrepreneurship. Also empirical research should be developed. There are a lot of possibilities to conduct comparative research of various dimensions, types and conditionings of entrepreneurship in the international scale. Recommended research contributes to the development of the scientific discipline and can be used in practice both at the micro-level by entrepreneurs and managers, and at the macro-level, by economic and political decision makers.

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## Author

**Agnieszka Głodowska**

Assistant Professor in the Department of International Trade, PhD in economics, author of the publications on international business and international entrepreneurship, member of editorial boards of 'Entrepreneurial Business and Economics Review' (Scopus, ESCI WoS), 'International Journal of Managerial Studies and Research' (USA), 'International Entrepreneurship' (Poland). Research interests: international entrepreneurship, finance and risk in international business.
**Correspondence to:** Dr Agnieszka Głodowska, Cracow University of Economics, ul. Rakowicka 27, 31-510 Kraków, Poland, e-mail: glodowsa@uek.krakow.pl
**ORCID** http://orcid.org/0000-0002-5317-8625

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# The Similarity of the Demand Structure as a Determinant of the Commodity Structure of Bilateral Trade in the European Union Countries

**Marek Maciejewski**

**ABSTRACT**

**Objective:** The aim of the article is to determine the influence of the process of convergence of the demand structure in the European Union countries on the share in the export structure of groups of products distinguished due to the share of the technological factor.

**Research Design & Methods:** A dynamic analysis of the similarity of the demand structure of the EU countries was made in the article. The interdependence between the convergence of the demand structure and the reduction of distance in the economic development level was presented. An analysis of the commodity structure of bilateral trade of the EU countries was conducted and the gravity model of foreign trade was used.

**Findings:** Similarity in the demand structure of trade partners influences the commodity structure of trade between them. The effects of this influence are different for trade relations of countries which are on a different level of economic development.

**Implications & Recommendations:** Conclusions drawn from the article are useful for the economic policy and support for exports. The research is worth continuing and completing with methods enabling the reference to more complex dependencies influencing the process of the demand structure convergence.

**Contribution & Value Added:** The article fills the research gap with regard to determining the influence of the alignment of the level of economic development on the convergence of the demand structure and referring this process to changes in the commodity structure of exports.

| | |
|---|---|
| **Article type:** | research article |
| **Keywords:** | commodity structure; demand structure; exports; gravity model; international trade |
| **JEL codes:** | E21, F14, F43 |

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## INTRODUCTION

Among international trade theories there are those which focus on the determination of the significance of demand and supply for the exchange with abroad. The significance of differences in equipping countries with factors of production is emphasized by the Heckscher-Ohlin theory. From it we can conclude that the development of bilateral trade will take place in the first place between countries with a different level of economic development, which translates into the resources of production factors being at the disposal. On the other hand, Linder's preference similarity theory (1961) resigns from associating trade with equipping countries with factors of production, as it marginalises the supply side to the benefit of the demand approach, according to which trade cooperation will develop mainly between countries with a similar demand structure, thus, on a similar level of economic development. A country exports mainly such goods for which there is already demand on the internal market. It guarantees undertaking profitable production and conducting effective competition with producers of identical or similar goods on foreign markets. It allows to increase the production scale based on the experience gained so far.

In spite of the fact that Heckscher-Ohlin theory and Linder's theory were created several dozen years ago, authors still write new papers (Lai *et al.*, 2016; Görkemli *et al.*, 2018) which attempt to diagnose the export development path, opposing these theories. In numerous works Linder's theory is empirically tested (McPherson *et al.*, 2001; Dhakal *et al.*, 2011; Viciu *et al.*, 2016), referring it, however, only to the difference in the level of GDP per capita and skipping the issues of the difference in the trade commodity structure. I decided to fill this research gap, completing the deliberations with a real analysis of the process of convergence of the demand structure. The aim of the article is to determine the impact of this process on the share in the export structure of groups of products distinguished for the share of the technological factor. And here we can put forward the hypothesis that greater sensitivity to the distance between trade partners will be characteristic for goods with a low share of technology.

In the research part I focused in the first place on the analysis of the demand structure of the European Union countries. Then I conducted a dynamic comparative analysis of the demand structures of each pair of those countries. I distinguished in it the EU member states before the enlargement in 2004 (EU15) and new member states (EU10, as I excluded Croatia, Cyprus, Malta from the analysis, due to lack of data or their incompleteness). In the first part I conducted an analysis of the correlation between the convergence process of the demand structure and shortening the distance in the economic development level of the countries, measured with GDP per capita. Then, using the gravity model of foreign trade, I analysed the influence of selected factors, with special consideration to the convergence process of the demand structure, on the commodity structure of exports of the EU states in their bilateral trade.

## LITERATURE REVIEW

The empirical verification of Linder's theory, observed in the literature of the subject, does not bring explicit conclusions. Its confirmation based on the analysis of the impact of differences in the value of GDP per capita on streams of trade can be found already in the

works by Sailors *et al.* (1973), Thursby and Thursby (1987), but also in more recent publications which include works by such authors as Fink *et al.* (2005) or Faustino and Leitão (2006) with regard to Portuguese industry products, and Çağlayan-Akay and Oskonbaeva (2018) for trade of selected OECD countries. Some of the studies (Chow *et al.*, 1999) indicate limitations of the verifiability of the theory to entities on a higher level of economic development. For example, Hanink (1988) observed that a high level of trade between similar but poor countries is unlikely. The theory was not confirmed in the results obtained for individual countries of East Africa (McPherson *et al.*, 2001), or in research findings for East Asia countries (Dhakal *et al.*, 2011) or Romania (Viciu *et al.*, 2016).

It seems that the role of territorial distance when conducting cross-border activity is quite important. It is a factor which may disturb or weaken the trend of export growth arising from similarity of the demand structure. Although Cairncross (2001) observes that at present geographical distance is not important in the era of global markets, Ellis (2007)emphasizes the fact that empirical evidence indicates that distance still matters, also in hi-tech goods trade. A lot of research points to a negative relationship of trade and distance (Batra, 2006; Ravishankar & Stack, 2014; Maciejewski, 2017). The research by Linnemann (1966), as well as Frankel *et al.* (1997) emphasize major costs affecting trade, namely physical shipment cost, cost related to time and cost of the ignorance of culture (Lai *et al.*, 2016).

## MATERIAL AND METHODS

According to Linder's theory (1961), the alignment of the level of GDP per capita of countries leads to the standardisation of their demand structure. To determine the demand structure of the European Union countries I initially adopted three methods based on:

- global demand structure (GDP_demand),
- the structure of demand for products according to their durability level (Durable_demand),
- the structure of consumption expenses according to COICOP (COICOP_demand).

In the analysis of the global demand structure (GDP_demand) I used a four-element system including the demand of the state, private consumption demand, private investment demand and net exports (Malmberg & Power, 2005). In the literature there is an emphasis on the significance of the impact of changes in the level of economic development on shifts in the global demand structure between its elements (Cavallo, 2005; Włodarczyk, 2015). It is related to transformations in the production structure, the growth of the importance of the services sector and the use of modern technologies.

In the structure of demand for products according to their durability level (Durable_demand) there are also four elements distinguished: durable goods, semi-durable goods, non-durable goods and services. In the demand structure there is a shift towards durable goods in response to rising incomes (Lee, 1964; Conrad & Schroeder, 1991). Possessing durable goods is regarded the indicator of the economic development level of a country (Beerli, 2010).

The most extended demand structure is included in the classification of consumption expenses according to COICOP (COICOP_demand). The Classification of Individual Consumption by Purpose (COICOP) was developed by the United Nations Statistical Division for the classification and analysis of individual consumption expenses incurred

by households and non-commercial institutions acting for households and governmental and self-governmental institutions (UN, 2018). On the level of a two-digit code of divisions, COICOP groups the areas of expenses of households for consumption goods and services: food and non-alcoholic beverages (01), alcoholic beverages and tobacco (02), clothing and footwear (03), housing and energy carriers (04), furnishings, household equipment and routine household maintenance (05), health (06), transport (07), information and communication (08), recreation and culture (09), education (10), restaurants and hotels (11) other goods and services (12). In the demand structure of countries on a lower level of economic development, expenses for food and non-alcoholic beverages prevail. It is confirmed by the data for new European Union member states, where at the beginning of the analysed period, in 2000, this category of products absorbed over 20% of expenses in the case of seven of them (even more than 30% in Romania and Lithuania). On the other hand, among EU15 countries, the highest 16% share of this group of products was marked only by the poorest of them – Greece and Portugal. Economic growth, bringing a higher level of manageable income should lead to appropriate shifts in the consumption expenses structure. In 2017 only in four European Union countries food expenses constituted 20% of total consumption expenses, not exceeding the level of 30% (EUROSTAT, 2019).

Based on the methodology described by Wydymus (1988), I conducted a dynamic comparative analysis of the demand structures of the European Union countries, for the three aforementioned ways of determining the demand structure. In all those cases, for each *i*-th object (the European Union country, *i*=1,…,*k*) I analysed the structure described with the series *m* (*j*=1,…,*m*) of indicators of the share of the elements of structure *q* in total demand (*q*=$q_1$,…,$q_m$) in individual years *t* of the analysed period (*t*=1,…,*n*). Due to the fact that for each method there is the following formula adopted:

$$q_{jt}^{i} = \frac{x_{jt}^{i}}{\sum_{j=1}^{m} x_{jt}^{i}} \tag{1}$$

the following conditions are fulfilled:

$$q_{jt}^{i} \in [0; 1] \tag{2}$$

and

$$\sum_{j=1}^{m} x_{jt}^{i} = 1 \tag{3}$$

where:

$x_{jt}^{i}$ - expressed in Euro value of *j*-th element in the demand structure of the *i*-th country in year *t*;

$q_{jt}^{i}$ - share of *j*-th element in the demand structure of *i*-th country in year *t*;

$i$ - European Union countries (*i* = 1, …, *k*);

$j$ - demand structure elements (*j* = 1, …, *m*), where depending on the adopted method: $m$=4 for GDP_demand and Durable_demand or $m$=12 for COICOP_demand;

$t$ - individual years (*t* = 1, …, *n*), where:

$n$ **-** number of analysed years in the period 2000-2017.

Data obtained from the Eurostat base (2019) allowed to construct for individual countries, for each of the three methods, a three-dimensional matrix of information, composed of the series of sub-matrices in the following form:

$$Q^i \Rightarrow \{[Q^1_{jt}], [Q^2_{jt}], \ldots, [Q^k_{jt}]\} \tag{4}$$

Each of the matrices of the above series has the form of:

$$Q^i = \begin{bmatrix} Q^i_{1t} \\ \vdots \\ Q^i_{jt} \end{bmatrix} = \begin{bmatrix} q^i_{11} & \ldots & q^i_{1n} \\ \vdots & \vdots & \vdots \\ q^i_{m1} & \cdots & q^i_{mn} \end{bmatrix} \tag{5}$$

In the comparative analysis of the demand structures, the basis of the research are individual, treated separately, matrices $Q^i$, forming the series (4). I conducted a study of the similarity of the demand structures for each pair of the European Union countries in individual years of the period. As, due to incomplete data, I excluded Croatia, Cyprus and Malta from the analysis, I obtained 300 pairs of countries[1], which gives 5,400 observations for 18 years included in the analysis.

As the measure of the demand structures dissimilarity for each pair of countries *i* and *l* in year *t* I adopted Euclidian distance, given in the formula (McCune & Grace, 2002):

$$d^t_{il} = \sqrt{\sum_{j=1}^{m} \left(q^i_{jt} - q^l_{jt}\right)^2} \tag{6}$$

The value of measure (6) is the closer to zero, the more similar the discussed demand structures of two countries are, and with the rise in the dissimilarity structures level its values are higher and higher. I presented a fragment of the obtained results which indicate changes in the similarity of the demand structure in one of the analysed pairs of countries – in Poland and Germany – in Figure 1.

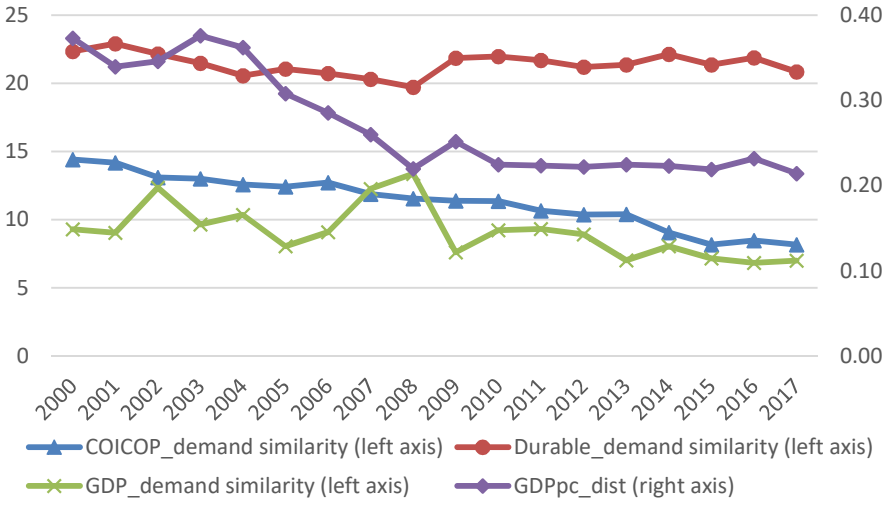


**Figure 1. Similarity of the demand structure and the distance of GDP per capita between Poland and Germany in the years 2000-2017**

Source: own calculations based on the data of EUROSTAT (2019).

[1] At this stage I eliminated the differentiation in the arrangement Reporter_A-Partner_B and Reporter_B-Partner_A., but it will be important in the further part of the analysis devoted to the export structure, which will cause doubling of the number of observations.

What results from Chart 1 is that the highest level of dissimilarity in the demand structures in Poland and Germany refers to the structure basing on the demand for products according to their durability level. On a lower level, with a declining trend, dissimilarity forms in the global demand structure and the structure of consumption expenses according to COICOP. I obtained similar comparisons, which I am not able to place here, for all pairs of the European Union countries.

As it was mentioned before, Linder's theory indicates close relationship between the alignment of the economic development level of countries, whose measure is GDP per capita, and the convergence of the demand structure. I decided to leave in the further analysis in the area of interest, only this form of the presentation of the demand structure whose changes in similarity are correlated to the highest extent with changes in the distance in the GDP level per capita of the analysed pairs of countries.

For this purpose I calculated the indicator of a relative difference in the level of GDP per capita of entities *i* and *l* belonging to the analysed pairs of countries (*GDPpc_dist*$_{il}$) in individual years by means of the formula (Somma, 1994):

$$GDPpc\_dist_{il}^{t} = 1 + \frac{(w)ln(w)+(1-w)ln(1-w)}{ln(2)} \quad (7)$$

where:

$$w = \frac{GDPpc_{i}^{t}}{GDPpc_{i}^{t}+GDPpc_{l}^{t}} \quad (8)$$

whereas:

$GDPpc_{i}^{t}; GDPpc_{l}^{t}$ - mean, respectively, GDP per capita in country i and l in year t.

The indicator is a normalised measure adopting values from the range [0,1], where zero means identical GDP per capita of countries, and approximation to one is equal to the growth of the difference between their GDP per capita.

In Figure 1 the broken line stands for a change in the distance in GDP per capita between Poland and Germany in the period 2000-2017. Its run shows the gradual reduction of this distance and the highest convergence of this process with the convergence of consumption expenses structure according to COICOP (a correlation coefficient between these variables in the period 2000-2017 was 0.821). The convergence is high also with regard to the other pairs of the European Union countries. Table 1 presents a correlation coefficient between changes in the distance of GDP per capita and changes in the level of similarity of the demand structure for the European Union countries and the groups of countries distinguished from them (EU10 and EU15).

The analysis of the data from Table 1 allows to prove positive correlation between reduction of the distance of GDP per capita and the process of convergence of the demand structures for pairs of countries in all the analysed groups of the European Union countries. This correlation the strongest when changes in the demand structure are represented by shifts in consumption expenses classified according to COICOP. Only within mutual relations of countries from the EU15 group transformations in the global demand structure were more significant. Changes in the distance of GDP per capita and convergences in the demand structures within EU 10 countries, characterised by a lower, similar within the group, level of economic development, were the most poorly correlated. It lets us think that they are oriented to the consumption level of more highly developed countries.

**Table 1. Correlation coefficient between changes in the distance of GDP per capita and similarity of the demand structure for the group of the European Union countries in the years 2000-2017**

| Group of countries | | Number of | | Correlation coefficient: *GDPpc_dist* and | | |
|---|---|---|---|---|---|---|
| **Reporter** | **Partner** | **Countries pairs** | **Observations** | **COICOP_ Demand similarity** | **Durable_ Demand similarity** | **GDP_ demand similarity** |
| EU10 | EU10 | 45 | 810 | 0.4127 | 0.0762 | 0.3615 |
| EU10 | EU15 | 150 | 2700 | 0.6226 | 0.1181 | 0.5622 |
| EU10 | EU28 | 195 | 3510 | 0.6463 | 0.3276 | 0.5674 |
| EU15 | EU15 | 105 | 1890 | 0.5134 | 0.1973 | 0.7624 |
| EU15 | EU28 | 255 | 4590 | 0.6959 | 0.5039 | 0.3972 |
| EU28 | EU28 | 300 | 5400 | 0.6801 | 0.5053 | 0.4361 |

Source: own calculations based on the data of EUROSTAT (2019).

In the light of the above, I decided to relate the analysis of bilateral trade of the European Union countries to changes in the structure of their demand expressed in the level of consumption expenses classified according to COICOP.

In order to do this, I used the gravity model of foreign trade, whose idea referring to Newton's gravitation law assumes that the value of trade exchange between two countries is proportional to the product of income of those countries, thus, to their masses, and inversely proportional to the distance between them, which translated into the costs of transport, diminishing the attractiveness of trade exchange (Tinbergen, 1962). The concept has become a popular instrument of trade modelling, mainly due to the possibility to develop a formula with new variables for the needs of testing their impact on trade streams (Maciejewski & Wach, 2019). In the group of model variables explaining bilateral trade of the European Union countries I decided to include the measure of similarity of their demand structure based on consumption expenses classified according to COICOP (COICOP demand similarity, $COICOP\_DS_{il}$). In the group of the remaining explanatory variables I included the basic data of the gravity model:

- GDP of exporter ($GDP_i$) and GDP of its trade partner ($GDP_l$) based on UNCTAD data (2019),
- distance in kilometres between trade partners' capital cities ($Dist_{il}$) based on CEPII base (2019)

and

- distance between the value of GDP of the exporter and its trade partner ($GDP\_dist_{il}$), calculated in accordance with formulas (7) and (8),
- value of GDP per capita of the country of exporter ($GDPpc_i$) and its trade partner ($GDPpc_l$) based on UNCTAD data (2019),
- dummy variable which indicates the possession of a common border by a pair of countries ($Border_{il}$).

The dependent variable in the model is the share in the structure of the exports of products classified based on their technological advancement on the basis of the methodology proposed by Lall (2000). In this approach, we distinguish in the export structure:

- primary products (PP) with scarce technological advancement,
- resource based products (RB) primarily using local abundance of natural resources,
- low technology products (LT) mainly using technologies included in capital equipment,
- medium technology products (MT), which use technologies with moderate engagement of R&D,
- high technology products (HT) using advanced and fast changing technologies, and those requiring investment in R&D.

Therefore, I estimated parameters of five models for the share in the exports share ($Ex_{il}$) of individual categories of products *j* (*j*=1,…*m*). Models of bilateral trade of countries *i*, *l*, take on the following form:

$$Ex_{ilj}^{t} = \alpha_0 + \alpha_1 COICOP\_DS_{ilj}^{t} + \alpha_2 GDP_{ij}^{t} + \alpha_3 GDP_{lj}^{t} + \alpha_3 Dist_{ilj}^{t} + \alpha_3 Border_{ilj}^{t} + \alpha_4 GDP\_dist_{ilj}^{t} + \alpha_5 GDPpc_{ij}^{t} + \alpha_6 GDP_{lj}^{t} + \varepsilon_{ilj}^{t} \quad (9)$$

In order to consider the specific character of trade between partner in sa similar and on different levels of economic development, I estimated four time in the Reporter-Partner arrangement:

- EU10-EU10 – exports of EU10 countries to the market of the remaining countries of this group (90 pairs of countries, 1,620 observations in the period of the analysed 18 years),
- EU10-EU15 – exports of EU10 countries to the market of EU15 countries (150 pairs of countries, 2,700 observations),
- EU15-EU10 – exports of EU15 countries to the market of the remaining countries of this group (150 pairs of countries, 2,700 observations)
- EU15-EU15 – exports of EU15 countries to the market of the remaining countries of this group (210 pairs of countries, 3,780 observations).

## RESULTS AND DISCUSSION

I estimated the values of the models' parameters with the panel regression method in Gretl software. Wald test and Breusch-Pagan test (Zaman, 2000) excluded the possibility of correct deduction based on the classical least squares method (*pooled OLS*), and in all the cases Hausman test indicated the superiority of fixed effects estimator (FE) over the random effects estimator (RE). However, FE estimator, due to collinearity, does not allow to use the variables whose values are fixed in time for each pair of countries. In the conducted analysis it concerned the variables which are crucial for gravity models, such as geographical distance and the common border. In those cases I applied two-level regression (Chenga & Walla, 2005), on the second stage making the regression of those variables on the absolute term which were obtained on the first stage, including the remaining data (I presented the results obtained in this way in the summary below in italics). I conducted the diagnosis of the models with regard to the normality of the distribution of residuals and heteroscedasticity based on Doornik-Hansen and Wald test.

In Table 2 I present the results of the estimation for the whole model only for trade within EU15 countries, and in Table 3 I presented the results obtained from all the models, but only with reference to variable $COICOP\_DS_{il}$, as the parameter estimated for this variable is the main area of interest in this article.

The analysis of the results included in Table 2 shows that individual elements of the commodity structure of exports in trade between EU15 countries in react differently to changes in explanatory variables adopted for the analysis. For example, possessing a common border (*Border*$_{il}$) promotes an increase in the share in the export structure of basic goods (PP), resource based ones (RB) and low technology products (LT) at the expense of more technologically advanced products (MT and HT), whose share in the export structure declines. It indicates limitations in the entry to distant markets for low technology goods which are sold mainly in the nearest geographical environment. And the distance expressed in the distance between countries' capital cities is less important – in this case the value of the parameter is close to zero, and the variable for low and medium technology goods is statistically insignificant. Distance measured with the size of economies is more important (*GDP_dist*$_{il}$). The bigger it is, the smaller the shares of low and medium technology goods in exports are. However, it does not concern technologically most advanced goods, which means that those products are least sensitive to the distance between the sizes of economies.

**Table 2. Estimation of model parameters using the FE estimator for exports of EU15 group countries to EU15 group countries**

| Variable | PP | RB | LT | MT | HT |
|---|---|---|---|---|---|
| *Const* | 11.542***<br>(0.953) | 21.063***<br>(1.687) | 22.484***<br>(1.365) | 27.685***<br>(1.552) | 17.226***<br>(2.191) |
| *COICOP_DS*$_{il}$ | -0.316***<br>(0.056) | -0.834***<br>(0.099) | 0.188**<br>(0.080) | 0.613***<br>(0.091) | 0.349***<br>(0.128) |
| *GDP*$_i$ | 0.000<br>(0.000) | 0.000***<br>(0.000) | 0.000***<br>(0.000) | -0.000***<br>(0.000) | -0.000<br>(0.000) |
| *GDP*$_l$ | 0.000<br>(0.000) | 0.000<br>(0.000) | -0.000***<br>(0.000) | -0.000<br>(0.000) | 0.000***<br>(0.000) |
| *Dist*$_{il}$ | -0.000***<br>(0.000) | 0.000***<br>(0.000) | 0.000<br>(0.000) | -0.000<br>(0.000) | -0.000***<br>(0.000) |
| *Border*$_{il}$ | *1.679****<br>*(0.398)* | *4.506****<br>*(0.537)* | *3.519****<br>*(0.519)* | *-2.250****<br>*(0.581)* | *-7.557****<br>*(0.606)* |
| *GDP_dist*$_{il}$ | -3.818*<br>(2.064) | 18.681***<br>(3.654) | -13.475***<br>(2.957) | -15.206***<br>(3.361) | 13.818***<br>(4.747) |
| *GDPpc*$_i$ | -0.000<br>(0.000) | 0.000*<br>(0.000) | 0.000<br>(0.000) | 0.000**<br>(0.000) | -0.000***<br>(0.000) |
| *GDPpc*$_l$ | 0.000***<br>(0.000) | -0.000<br>(0.000) | -0.000***<br>(0.000) | 0.000***<br>(0.000) | -0.000***<br>(0.000) |
| LSDV R-squared | 0.846 | 0.756 | 0.821 | 0.843 | 0.672 |
| Within R-squared | 0.061 | 0.055 | 0.028 | 0.055 | 0.054 |

Note: PP – Primary products, RB – Resource based products, LT – Low technology products, MT – Medium technology products, HT – High technology products. Estimated standard errors appear in parentheses. *** p < 0.01; ** p < 0.05; * p < 0.10.
Source: own calculations based on the data of UNCTAD (2019) and EUROSTAT (2019).

With regard to the analysis of the influence of the convergence of the demands structures (*COICOP_DS*$_{il}$) on the share of individual categories of goods in the export structure, unambiguous responses for all groups of countries concern the basic products (PP) only. Their share in the export structure grows with a decline in the dissimilarity of the demand

structure of trade partners. It means that those products reveal high sensitivity to differences in buyers' preferences. We can conclude that in this case the market entry strategy consists in the use of the position on the domestic market and copying locally proven solutions based on specific consumption patterns, which is possible only when they are characterised by a high level of similarity. Opposite conclusions may be drawn due to the results obtained for the exports of products of medium (MT), low (LT) and – to the smallest extent – high (HT) technology. The share of those products in the export structure was growing with an increase in the dissimilarity of the demand structure of trade partners, which points to lower sensitivity of those product categories to differences in the demand structure, thus, their greater universality. However, it is worth emphasizing that with regard to HT products, it concerns only trade within the EU15 countries group and for LT products it does not concern trade within the group of EU10 countries. It proves a different impact of the convergence of the demand structure on the commodity structure of trade for countries at a different level of economic development.

**Table 3. Estimation of COICOP_DS variable using the FE estimator for EU countries exports**

| Variable | PP | RB | LT | MT | HT |
|---|---|---|---|---|---|
| EU10-EU10 | -10.289*<br>(5.681) | 6.497<br>(9.582) | -14.509*<br>(8.102) | 29.204***<br>(10.426) | -10.902<br>(10.247) |
| EU10-EU15 | -0.570***<br>(0.092) | 0.375***<br>(0.129) | 0.662***<br>(0.135) | 0.101<br>(0.158) | -0.568***<br>(0.139) |
| EU15-EU10 | -0.089<br>(0.061) | -0.314***<br>(0.101) | 0.291***<br>(0.085) | 0.408***<br>(0.119) | -0.296***<br>(0.110) |
| EU15-EU15 | -0.316***<br>(0.056) | -0.834***<br>(0.099) | 0.188**<br>(0.080) | 0.613***<br>(0.091) | 0.349***<br>(0.128) |

Note: PP – Primary products, RB – Resource based products, LT – Low technology products, MT – Medium technology products, HT – High technology products. Estimated standard errors appear in parentheses. *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Source: own calculations based on the data of UNCTAD (2019) and EUROSTAT (2019).

## CONCLUSIONS

The conducted analysis proves that the similarity of the demand structure of trade partners affects the commodity structure of the trade between them. It turns out, however, that the effects of this influence are different for trade relations of countries on a different level of economic development. It concerns particularly technologically advanced products. Although the convergence of the demand structure favours the growth of share in the export structure of all the EU countries, as for the trade with goods using technology, particularly HT products, it concerns mainly EU new member states. For the EU countries at a higher level of economic development the distance of the demand structure is not that significant in the exports of technologically advanced products. On the contrary, their share in the commodity structure of exports grows at the expense of basic products, the supply of which is burdened with costs related to geographical distance. Linder's theory corresponds with the traditional stages theory of internationalisation, which suggests that firms internationalise only after a period of domestic maturing. Therefore, in the first phase they operate only on the internal market, and only with growing experience they

gradually enter foreign markets. The most known stages model is regarded to be the Uppsala model by Johanson and Vahlne (1977), assuming the stepwise internationalisation process, starting from the lack of regular exports activity, through exports with the use of intermediaries, trade affiliates, and ending with manufacturing affiliates characterised by the highest level of engagement on foreign markets. In the stages approach, the internationalisation of firms is perceived as an effect of the learning process, with which the engagement of resources on foreign markets is growing (Wach, 2014). However, we can assume that such an internationalisation model is adopted mainly in traditional industries. Firms operating in high tech industries usually skip individual stages of internationalisation, they undertake activity on international markets from inception or soon after their establishment (Daszkiewicz, 2019). Their offer is more universal and less prone to an influence of the differences in the demand structure.

The conducted analysis is based only on macro-economic data, which is a limitation, as decisions about undertaking trade exchange in a specific industry and geographical direction are taken on the firm's level. However, the problem is worth further research to be conducted. A method which should be used in it is the structural modelling method – SEM, which allows to draw conclusions with reference to more complex dependencies, which would enable to consider a number of other factors in addition to GDP per capita, affecting the process of the demand structure convergence.

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## Author

**Marek Maciejewski**
Assistant Professor in the Department of International Trade, PhD in economics, author of publications on international trade, scientific secretary of the journal 'International Entrepreneurship'. He was the chairman and member of the organizing committees of many national and international conferences. He is a member of international scientific societies, including Academy of International Business (AIB) and European International Business Academy (EIBA).
**Correspondence to:** Dr Marek Maciejewski, Cracow University of Economics, ul. Rakowicka 27, 31-510 Kraków, Poland, e-mail: maciejem@uek.krakow.pl
**ORCID** http://orcid.org/0000-0003-1343-3764

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