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Dependencies between Variables from the Area of the Monetary and Fiscal Policy in the European Union Countries

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Abstract

Research background: The core of coordinating a monetary and fiscal policy (policy mix) is based on combining both policies to achieve goals related to price stability, as well as economic growth and employment. In turn, the decisions of economic authorities in the monetary-fiscal game have a significant impact on economic variables in the economy. In the economic literature, the importance of monetary and fiscal policy coordination is emphasized as it has a positive effect on the stability of the economy.
Purpose of the article: The aim of the article is to identify the dependencies between variables in the scope of fiscal policy and monetary policy under existing economic conditions and then assess their impact on the economy in the EU countries.
Methods: To achieve this objective, the following research methods were used: a review of the scientific literature, a presentation of statistical data, and statistical research methods.
Findings & Value added: The rationale for adopting such issues is to examine the impact of the financial crisis on the decisions of central banks and governments in the EU. The financial crisis has affected a change in the approach to conducting monetary and fiscal policy. The changing economic conditions forced economic authorities to take many decisions that affected the interaction between the central bank and the governments in the EU Member States. In many EU countries in the discussed period, there were significant interdependencies between variables in both monetary and fiscal policy.

Keywords: fiscal policy, monetary policy, coordination, European Union

JEL: E00, E52, E62

Introduction

The decisions of economic authorities (central bank and governments) in monetary and fiscal policy influence each other and also economic variables in the economy. As a result of the monetary and fiscal game of decision-makers striving to achieve their different goals and preferences, different policy mix combinations arise, which do not always positively impact the stability of the economy. Hence, the economic literature emphasizes that coordinating monetary and fiscal policy positively affects the stability of a given economy. The interaction between monetary policy and fiscal policy variables is influenced by many factors, often independent of economic authorities such as financial crises.

Therefore, the purpose of the article is to identify the interaction between fiscal and monetary policy under existing economic conditions and then assess their impact on the economy in the EU countries. To achieve the goal, the following research methods were used: a review of the scientific literature, a presentation of statistical data, and statistical research methods. The article verifies the hypothesis that interdependencies between policy mix variables in many EU countries are relevant. During the analyzed period, between 2004–2018, the EU Member States experienced a financial and economic crisis, which influenced many monetary and fiscal policy decisions. The article underlines the impact of the economic crisis on economic variables in the field of policy mix in the EU countries. In numerous EU Member States, there were significant interdependencies between variables in the field of monetary and fiscal policy in the discussed period, which may indicate the existence of significant interactions of decision-making economic authorities.

The structure of the paper is as follows. Section One presents the findings of a review of studies on the monetary and fiscal game in the economy. Section Two contains an analysis of selected monetary and fiscal policy variables in the EU countries. Section Three presents a study on the interaction of variables in the policy mix in the EU Member States. The last section concludes.

Literature review

There are numerous interdependencies (interactions) between monetary and fiscal policy. These interactions occur in three dimensions: (1) the institutions (decision-makers), (2) the targets, and (3) the instruments. The first level covers the relations between the entities responsible for implementing the monetary and fiscal policy, i.e., the central bank and the government. The second level refers to the objectives pursued by the institutions, while the monetary and fiscal authorities usually have different goals, which is the reason for conflicts. Referring to the third level, i.e., instruments available to decision-makers, we stress that each of them, using separate instruments, influences the economy in various ways and with a different time lag. The relationship between

monetary and fiscal policy can be partially described using the monetary policy instrument as the interest rate. By setting the interest rate, the central bank considers the potential impact of deficit and public debt on the level of prices and interest rates, among others (Hughes Hallett et al. 2014). In economic practice, monetary and fiscal authorities use a specific combination of instruments by determining the policy mix or "mix" of economic policy tools (Clarida et al. 2000; Samuelson and Nordhaus 2010, pp. 139–199).

The central bank is responsible for monetary policy, while the government is responsible for fiscal policy. Both policymakers set their goals, which in the case of the central bank, is most often inflation; the government deals with production or employment levels. Both parties also determine their preferences, which correspond to the weightings in the loss functions of both authorities, recorded in formulas 1 and 2 (Dixit and Lambertini 2003, pp. 1522–1542):

Formula 1:

$$L_F = \frac{1}{2}[\,(\pi - \pi_F)^2 + \theta_F \left(y - y_F\right)^2 + 2\delta x\,]$$

Formula 2:

$$L_M = \frac{1}{2}[\theta_M (y - y_M)^2 + \left(\pi - \pi_M\right)^2\,]$$

where L_F – the social loss function for the fiscal authorities, which the government is trying to minimize; L_M – the loss function for the monetary authorities that the monetary authority minimizes; y and π are the current levels of production and inflation, y_M – the central bank's output target; y_F – a GDP that minimizes social losses or the effective level of production; π_F – the average level of fixed prices in the economy, which is socially optimal to minimize price differentiation; π_M – the inflation target for the monetary authorities; x – fiscal policy; and θ_F, θ_M, δ – parameters relating to production.

In order to achieve an equilibrium of the game, the minimum loss function of each decision-maker should be determined, taking into account the limitations resulting from the structure of the economy and the actions of the other player. Considering the instruments of the central bank and the government, the reaction function of both players can be determined, and comparing these functions leads to equilibrium (Cechetti 2000, pp. 43–59).

In the fiscal-monetary game with the Nash equilibrium, two players of equal status select a strategy under the assumption that the partner's strategy is known. Neither player can one-sidedly improve their situation as they each believe that their strategy is optimal (Woroniecka-Leciejewicz 2015). The fiscal-monetary game presented as a matrix in Table 1 shows how important it is for the monetary authorities and the fiscal authorities to cooperate with each other, but it also demonstrates that

such cooperation is not easy to establish because the central bank usually aims to ensure the stability of prices, whereas the government seeks to keep economic growth high and unemployment low (Buiter and Panigirtzoglou 1999; Bhattacharya and Kudoh 2002).

Table 1. The monetary-fiscal game: results and payoffs

	Restrictive central bank monetary policy	Expansionary central bank monetary policy
Restrictive government fiscal policy	Result: low inflation and low employment Payoff: central bank: 6 + 1 = 7 government: 3 + 1 = 4	Result: moderate inflation and moderate employment Payoff: central bank: 4 + 2 = 6 government: 2 + 4 = 6
Expansionary government fiscal policy	Result: moderate inflation and moderate employment Payoff: central bank: 4 + 2 = 6 government: 2 + 4 = 6	Result: high inflation and high employment Payoff: central bank: 1 + 3 = 4 government: 1 + 6 = 7

Source: Bennett and Loayza 2001, p. 301.

Bennett and Loayza (2001) presented the monetary and fiscal game in the form of the matrix of this game, thus illustrating the strategic choices of the decision-makers, i.e., the central bank and the government. Both players can apply a restrictive or expansionary policy, which leads to different policy mix variants. Each decision-maker receives a different payment for individual results, i.e., each player receives a different value of the loss function. Players have different preferences regarding inflation and unemployment. For a given result, i.e., the level of unemployment and inflation, the players receive different payments. The central bank receives the highest payment for low inflation and the government for low unemployment.

In the fiscal-monetary game, the central bank's payoffs for low, medium, or high inflation are 6, 4, and 1, respectively. The payoffs for low, medium, and high employment are 1, 2, and 3. In the case of the fiscal authorities, low, medium, and high inflation involves payoffs of 3, 2, and 1, and the payoffs for low, medium, and high employment are 1, 4, and 6 (Bennett and Loayza 2001, p. 301).

In response to the central bank adopting an expansionary monetary policy, the government may introduce an expansionary fiscal policy. Then the central bank earns the lowest score of 4. Guessing what the government's strategy may be, the central bank goes for a restrictive monetary policy. To improve its situation, the government adopts an expansionary policy, which gives both authorities the same payoff of 6 (Table 1).

This matrix of the fiscal-monetary game well illustrates the degree of communication and collaboration problems that may result from their different goals (Van Aarle et al. 1995; Bhattacharya et al. 1998). For many economists, a coordinated monetary policy and fiscal policy are one of the best policy mix options. A lack of such coordi-

nation was criticized by, for instance, Nordhaus (1994, pp. 139–199). Moreover, Corsetti et al. (2016b, pp. 1–29) emphasized that in the event of a strong recession shock, a common monetary and fiscal policy may be necessary for a satisfactory stabilization of the economy. Corsetti et al. (2016a, pp. 151–160) hold a similar position, claiming that monetary policy cannot achieve the goals of stabilization without stronger support for fiscal policies.

Hein and Truger (2014, pp. 21–38) argue that post-Keynesian management of macroeconomic policy must be characterized by close coordination of fiscal and monetary tools. This is particularly true of a currency union such as the euro area, since the central bank's main instrument, i.e., the interest rate, cannot be adapted to the requirements of each country. Moreover, De Bonis and Della Posta (2009, pp. 214–263) show that countries that are members of the monetary union can increase prosperity by coordinating their actions even if one is much smaller than the other and the group is affected by an asymmetrical shock.

When analyzing the interactions of variables in the area of monetary policy and fiscal policy, the issue of time lags, which characterize the economic policy implementation process, should also be taken into account because they are an element that disturbs monetary-fiscal interactions (Havranek and Rusnák 2013). In our study, we will focus on correlative relationships between policy mix variables to investigate whether these variables interact with each other.

Data and research methodology

The research period covers the years 2004–2018. Ten countries joined the EU in 2004; therefore, this year was considered the beginning of the research period. In this period, the financial crisis of 2008–2009 began, which then turned into a public finance crisis. It was followed the long-term return of countries to the path of equilibrium of public finances expressed as GG (General Government) deficit to GDP.

In this part of the article, attention is focused on selected variables that characterize monetary and fiscal policy. Monetary policy variables include short-term interest rates, such as the three-month interbank rate (on an annual basis) in the EU Member States (IR) and inflation as the HICP measure – the annual average rate of change (HICP). In turn, the variables in fiscal policy include real GDP growth – the percentage change on the previous year (GDP growth), and General Government (GG) Deficit as a percentage of GDP (DEFICIT). The article verifies the hypothesis that interdependencies between policy mix variables in many EU countries are relevant. This means that they exist and are statistically significant.

In the context of the monetary and fiscal interactions, Pearson's correlation ratios between the monetary policy variables (IR, HICP) and fiscal policy variables (GDP growth, DEFICIT) were calculated for all EU countries between 2004 and 2018 to check between which variables there are significant monetary and fiscal interactions

(Table 6). The variables were tested for stationarity with the ADF test (Dickey-Fuller test). The time series of the analyzed variables turned out to be stationary only when using the first variable differences. Variables were transformed into first differences, yielding stationary series. In addition, the significance of correlations was also examined – a p-value <0.05 indicates significance at the 5% confidence level, and a p-value <0.1 indicates significance at the 10% level. The time series are also normally distributed.

Results of the empirical research

Analysis of selected variables in the area of monetary and fiscal policy in the EU countries, 2004–2018

Short-term interest rates in the EU countries varied significantly between 2004 and 2018 (Table 2), with the lowest interest rates in the euro-area countries. In 2004, the short-term interest rate was 2.1%, while in 2018, it dropped below zero (–0.3%). In 2007–2008 in the euro-area countries, the 3M interbank rate rose to 4.3% and 4.6%, respectively, which was influenced by the inflation increase above the inflation target (≤ 2%) in the euro area countries. In turn, the highest short-term interest rates were recorded in Romania, where in 2004 it was 19.1%, and 12.3% and 11.3% in 2008 and 2009, respectively. The short-term interest rate in Romania began to gradually decline after 2010 (6.5%), reaching 2.9% in 2018.

In comparison to other EU countries, high interest rates were recorded in Hungary. In 2004, it was 11.5%, and during the financial crisis, it was 8.8% in 2008 and 9.1% in 2009. Starting from 2010, short-term interest rates in Hungary started to fall, reaching 1% in 2016 and 0.1% in 2018. Relatively high interest rates were also recorded in Bulgaria (4.9% in 2007, 7.1% in 2008, and 5.7% in 2009) during the financial crisis, while between 2014 and 2016, these rates fluctuated below 0.8% (reaching 0.0% in 2018). Croatia, Poland, and the United Kingdom recorded interest rates higher than in the other EU countries in the analyzed period – especially before the crisis and during the financial crisis. The period 2016–2018 saw the highest short-term interest rates in Poland (1.7%).

Table 2. Short-term interest rates – three-month interbank rate in the EU countries – selected monetary policy variable

GEO/TIME	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Belgium	2.1	2.2	3.1	4.3	4.6	1.2	0.8	1.4	0.6	0.2	0.2	0.0	–0.3	–0.3	–0.3
Bulgaria	3.7	3.6	3.7	4.9	7.1	5.7	4.1	3.8	2.3	1.1	0.8	0.5	0.2	0.1	0.0
Czechia	2.4	2.0	2.3	3.1	4.0	2.2	1.3	1.2	1.0	0.5	0.4	0.3	0.3	0.4	1.3
Denmark	2.2	2.2	3.2	4.4	5.3	2.5	1.2	1.4	0.6	0.3	0.3	–0.1	–0.1	–0.3	–0.3
Germany	2.1	2.2	3.1	4.3	4.6	1.2	0.8	1.4	0.6	0.2	0.2	0.0	–0.3	–0.3	–0.3
Estonia	2.5	2.4	3.2	4.9	6.7	5.9	1.6	1.4	0.6	0.2	0.2	0.0	–0.3	–0.3	–0.3
Ireland	2.1	2.2	3.1	4.3	4.6	1.2	0.8	1.4	0.6	0.2	0.2	0.0	–0.3	–0.3	–0.3
Greece	2.1	2.2	3.1	4.3	4.6	1.2	0.8	1.4	0.6	0.2	0.2	0.0	–0.3	–0.3	–0.3
Spain	2.1	2.2	3.1	4.3	4.6	1.2	0.8	1.4	0.6	0.2	0.2	0.0	–0.3	–0.3	–0.3
France	2.1	2.2	3.1	4.3	4.6	1.2	0.8	1.4	0.6	0.2	0.2	0.0	–0.3	–0.3	–0.3
Croatia	7.3	6.2	4.5	5.7	4.7	7.9	2.3	2.9	2.7	1.3	1.0	1.3	0.9	0.6	0.5
Italy	2.1	2.2	3.1	4.3	4.6	1.2	0.8	1.4	0.6	0.2	0.2	0.0	–0.3	–0.3	–0.3
Cyprus	4.7	4.3	3.4	4.2	4.6	1.2	0.8	1.4	0.6	0.2	0.2	0.0	–0.3	–0.3	–0.3
Latvia	4.2	3.1	4.4	8.7	8.0	13.1	2.0	1.0	0.9	0.4	0.2	0.0	–0.3	–0.3	–0.3
Lithuania	2.7	2.4	3.1	5.1	6.0	7.1	1.8	1.7	1.1	0.5	0.3	0.0	–0.3	–0.3	–0.3
Luxembourg	2.1	2.2	3.1	4.3	4.6	1.2	0.8	1.4	0.6	0.2	0.2	0.0	–0.3	–0.3	–0.3
Hungary	11.5	6.7	7.2	7.9	8.8	9.1	6.2	6.6	8.1	4.2	2.5	1.5	1.0	0.2	0.1
Malta	2.9	3.2	3.5	4.3	4.6	1.2	0.8	1.4	0.6	0.2	0.2	0.0	–0.3	–0.3	–0.3
Netherlands	2.1	2.2	3.1	4.3	4.6	1.2	0.8	1.4	0.6	0.2	0.2	0.0	–0.3	–0.3	–0.3
Austria	2.1	2.2	3.1	4.3	4.6	1.2	0.8	1.4	0.6	0.2	0.2	0.0	–0.3	–0.3	–0.3
Poland	6.2	5.2	4.2	4.8	6.3	4.3	3.9	4.6	4.9	3.0	2.5	1.7	1.7	1.7	1.7
Portugal	2.1	2.2	3.1	4.3	4.6	1.2	0.8	1.4	0.6	0.2	0.2	0.0	–0.3	–0.3	–0.3
Romania	19.1	8.4	8.1	7.2	12.3	11.3	6.5	5.6	5.1	4.0	2.3	1.1	0.6	0.9	2.9
Slovenia	4.7	4.0	3.6	4.3	4.6	1.2	0.8	1.4	0.6	0.2	0.2	0.0	–0.3	–0.3	–0.3
Slovakia	4.4	2.6	4.1	4.0	3.9	1.2	0.8	1.4	0.6	0.2	0.2	0.0	–0.3	–0.3	–0.3
Finland	2.1	2.2	3.1	4.3	4.6	1.2	0.8	1.4	0.6	0.2	0.2	0.0	–0.3	–0.3	–0.3
Sweden	2.1	1.7	2.3	3.6	3.9	0.4	0.5	1.7	1.3	0.9	0.4	–0.3	–0.7	–0.7	–0.7
United Kingdom	4.6	4.8	4.8	6.0	5.7	1.3	0.7	0.9	0.8	0.5	0.5	0.6	0.5	0.4	0.7

Source: based on OECD (2019).

Table 3 presents the HICP inflation level as a monetary policy variable in the EU countries between 2004 and 2018. The countries with the highest inflation are Romania (11.9% in 2004, 9.1% in 2005, and 7.9% in 2008), Latvia (6.2% in 2004, 6.9% in 2005, 10.1% in 2007, and 15.3% in 2008), Bulgaria (6.1% in 2004, 7.4% in 2006, 7.6% in 2007, and 12% in 2008), Hungary (11.9% in 2004, 9.1% in 2005, 6.6% in 2006, and 7.9% in 2008), as well as Estonia (6.7% in 2007, and 10.6% in 2008) and Lithuania (11.1% in 2008). In these EU countries, inflation increased during the financial crisis, and these countries did not belong to the euro area. During the financial crisis, in the euro-area countries, inflation also rose, yet the highest value was observed in Slovenia (5.5% in 2008, although Slovenia only joined the eurozone in 2007), Malta (4.7% in 2008, which was Malta's entry to the euro area), Belgium (4.5% in 2008), and Cyprus (4.4% in 2008, the year of Cyprus's accession to the euro area). After the financial crisis, inflation fell sharply in most EU countries, and deflation was still observed in many countries in 2016. In 2018, the highest level of inflation was recorded in Romania (4.1%) and the lowest in Denmark and Ireland (0.7%).

Table 3. HICP – inflation – annual average rate of change – selected monetary policy variable

GEO/TIME	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Belgium	1.9	2.5	2.3	1.8	4.5	0.0	2.3	3.4	2.6	1.2	0.5	0.6	1.8	2.2	2.3
Bulgaria	6.1	6.0	7.4	7.6	12.0	2.5	3.0	3.4	2.4	0.4	–1.6	–1.1	–1.3	1.2	2.6
Czechia	2.6	1.6	2.1	2.9	6.3	0.6	1.2	2.2	3.5	1.4	0.4	0.3	0.6	2.4	2.0
Denmark	0.9	1.7	1.8	1.7	3.6	1.0	2.2	2.7	2.4	0.5	0.4	0.2	0.0	1.1	0.7
Germany	1.8	1.9	1.8	2.3	2.8	0.2	1.1	2.5	2.1	1.6	0.8	0.1	0.4	1.7	1.9
Estonia	3.0	4.1	4.4	6.7	10.6	0.2	2.7	5.1	4.2	3.2	0.5	0.1	0.8	3.7	3.4
Ireland	2.3	2.2	2.7	2.9	3.1	–1.7	–1.6	1.2	1.9	0.5	0.3	0.0	–0.2	0.3	0.7
Greece	3.0	3.5	3.3	3.0	4.2	1.3	4.7	3.1	1.0	–0.9	–1.4	–1.1	0.0	1.1	0.8
Spain	3.1	3.4	3.6	2.8	4.1	–0.2	2.0	3.0	2.4	1.5	–0.2	–0.6	–0.3	2.0	1.7
France	2.3	1.9	1.9	1.6	3.2	0.1	1.7	2.3	2.2	1.0	0.6	0.1	0.3	1.2	2.1
Croatia	2.1	3.0	3.3	2.7	5.8	2.2	1.1	2.2	3.4	2.3	0.2	–0.3	–0.6	1.3	1.6
Italy	2.3	2.2	2.2	2.0	3.5	0.8	1.6	2.9	3.3	1.2	0.2	0.1	–0.1	1.3	1.2
Cyprus	1.9	2.0	2.2	2.2	4.4	0.2	2.6	3.5	3.1	0.4	–0.3	–1.5	–1.2	0.7	0.8
Latvia	6.2	6.9	6.6	10.1	15.3	3.3	–1.2	4.2	2.3	0.0	0.7	0.2	0.1	2.9	2.6
Lithuania	1.2	2.7	3.8	5.8	11.1	4.2	1.2	4.1	3.2	1.2	0.2	–0.7	0.7	3.7	2.5
Luxembourg	3.2	3.8	3.0	2.7	4.1	0.0	2.8	3.7	2.9	1.7	0.7	0.1	0.0	2.1	2.0
Hungary	6.8	3.5	4.0	7.9	6.0	4.0	4.7	3.9	5.7	1.7	0.0	0.1	0.4	2.4	2.9
Malta	2.7	2.5	2.6	0.7	4.7	1.8	2.0	2.5	3.2	1.0	0.8	1.2	0.9	1.3	1.7
Netherlands	1.4	1.5	1.6	1.6	2.2	1.0	0.9	2.5	2.8	2.6	0.3	0.2	0.1	1.3	1.6
Austria	2.0	2.1	1.7	2.2	3.2	0.4	1.7	3.6	2.6	2.1	1.5	0.8	1.0	2.2	2.1
Poland	3.6	2.2	1.3	2.6	4.2	4.0	2.6	3.9	3.7	0.8	0.1	–0.7	–0.2	1.6	1.2
Portugal	2.5	2.1	3.0	2.4	2.7	–0.9	1.4	3.6	2.8	0.4	–0.2	0.5	0.6	1.6	1.2
Romania	11.9	9.1	6.6	4.9	7.9	5.6	6.1	5.8	3.4	3.2	1.4	–0.4	–1.1	1.1	4.1
Slovenia	3.7	2.4	2.5	3.8	5.5	0.8	2.1	2.1	2.8	1.9	0.4	–0.8	–0.2	1.6	1.9
Slovakia	7.5	2.8	4.3	1.9	3.9	0.9	0.7	4.1	3.7	1.5	–0.1	–0.3	–0.5	1.4	2.5
Finland	0.1	0.8	1.3	1.6	3.9	1.6	1.7	3.3	3.2	2.2	1.2	–0.2	0.4	0.8	1.2
Sweden	1.0	0.8	1.5	1.7	3.3	1.9	1.9	1.4	0.9	0.4	0.2	0.7	1.1	1.9	2.0
United Kingdom	1.3	2.1	2.3	2.3	3.6	2.2	3.3	4.5	2.8	2.6	1.5	0.0	0.7	2.7	2.5

Source: Eurostat Warehouse Database (n.d.).

Table 4 presents the real GDP growth rate as a percentage change on the previous year as a variable in fiscal policy. Observing data on GDP growth, during the 2008–2009 economic crisis, only Poland recorded a GDP increase between 2008 and 2009. After the financial crisis, the economic growth rate decreased significantly, and some countries, such as Italy, recorded a lower GDP growth than before the financial crisis. The economic performance, especially during the 2008–2009 crisis and after this period, required appropriate fiscal and monetary policies to stimulate economic growth.

In many EU countries, including Poland, in the face of challenges that emerged in connection with the financial crisis, monetary and fiscal authorities took coordinated actions to stimulate the economy. For example, the central bank introduced additional operations to support liquidity in the interbank market, and it lowered interest rates to stimulate economic activity. Meanwhile, it recommended a prudent lending and deposit policy for banks. In turn, in the initial phase of the crisis, the government increased budget spending, particularly spending on investments, and introduced legislative changes to stop unemployment and stimulate economic growth (Stawska and Grzesiak 2014, p. 148; Stawska 2017, pp. 205–210).

During the financial crisis (2008–2009), the lowest economic growth was recorded by Lithuania, Estonia, and Latvia (respectively: –14.8%; –14.7%; –14.4%). Then, as a result of the public debt crisis, the largest decreases in GDP were recorded by Greece (–9.1% in 2011), Portugal (–4.0% in 2012), Spain (–2.9% in 2012), Italy (–2.8% in 2012), and Cyprus (–5.8% in 2013). In 2018, the highest economic growth in the EU was recorded by Ireland (8.2%) and Malta (7.3%).

Table 4. Real GDP growth rate – percentage change on the previous year – selected fiscal policy variable

GEO/TIME	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Belgium	3.6	2.1	2.5	3.4	0.8	–2.3	2.7	1.8	0.2	0.2	1.3	1.7	1.5	1.7	1.5
Bulgaria	6.4	7.1	6.9	7.3	6.0	–3.6	1.3	1.9	0.0	0.5	1.8	3.5	3.9	3.8	3.1
Czechia	4.9	6.5	6.9	5.6	2.7	–4.8	2.3	1.8	–0.8	–0.5	2.7	5.3	2.5	4.4	2.8
Denmark	2.7	2.3	3.9	0.9	–0.5	–4.9	1.9	1.3	0.2	0.9	1.6	2.3	2.4	2.3	2.4
Germany	1.2	0.7	3.7	3.3	1.1	–5.6	4.1	3.7	0.5	0.5	2.2	1.7	2.2	2.2	1.5
Estonia	6.3	9.4	10.3	7.7	–5.4	–14.7	2.3	7.6	4.3	1.9	2.9	1.9	3.5	4.9	4.8
Ireland	6.6	5.7	5.0	5.3	–4.4	–5.0	1.9	3.7	0.2	1.3	8.8	25.1	5.0	7.2	8.2
Greece	5.1	0.6	5.7	3.3	–0.3	–4.3	–5.5	–9.1	–7.3	–3.2	0.7	–0.4	–0.2	1.5	1.9
Spain	3.2	3.7	4.2	3.8	1.1	–3.6	0.0	–1.0	–2.9	–1.7	1.4	3.6	3.2	3.0	2.4
France	2.8	1.7	2.4	2.4	0.3	–2.9	1.9	2.2	0.3	0.6	1.0	1.1	1.2	2.2	1.7
Croatia	3.9	4.1	4.9	5.3	2.0	–7.3	–1.5	–0.3	–2.3	–0.5	–0.1	2.4	3.5	2.9	2.7
Italy	1.6	0.9	2.0	1.5	–1.1	–5.5	1.7	0.6	–2.8	–1.7	0.1	0.9	1.1	1.6	0.8
Cyprus	5.0	4.9	4.7	5.1	3.6	–2.0	1.3	0.4	–2.9	–5.8	–1.3	2.0	4.8	4.5	4.1
Latvia	8.3	10.7	11.9	10.0	–3.5	–14.4	–3.9	6.4	4.0	2.4	1.9	3.0	2.1	4.6	4.3
Lithuania	6.6	7.7	7.4	11.1	2.6	–14.8	1.6	6.0	3.8	3.5	3.5	2.0	2.4	4.1	3.6
Luxembourg	3.6	3.2	5.2	8.4	–1.3	–4.4	4.9	2.5	–0.4	3.7	4.3	3.9	2.4	1.5	3.1
Hungary	5.0	4.4	3.9	0.4	0.9	–6.6	0.7	1.7	–1.6	2.1	4.2	3.5	2.3	4.1	5.1
Malta	0.4	3.8	1.8	4.0	3.3	–2.5	3.5	1.3	2.7	4.5	8.5	10.7	5.7	6.7	7.3
Netherlands	2.0	2.1	3.5	3.8	2.2	–3.7	1.3	1.6	–1.0	–0.1	1.4	2.0	2.2	2.9	2.6
Austria	2.7	2.2	3.5	3.7	1.5	–3.8	1.8	2.9	0.7	0.0	0.7	1.1	2.0	2.6	2.4
Poland	5.1	3.5	6.2	7.0	4.2	2.8	3.6	5.0	1.6	1.4	3.3	3.8	3.1	4.8	5.1
Portugal	1.8	0.8	1.6	2.5	0.2	–3.0	1.9	–1.8	–4.0	–1.1	0.9	1.8	1.9	2.8	2.6
Romania	8.4	4.2	8.1	6.9	9.3	–5.5	–3.9	2.0	2.1	3.5	3.4	3.9	4.8	7.0	4.4
Slovenia	4.4	4.0	5.7	6.9	3.3	–7.8	1.2	0.6	–2.7	–1.1	3.0	2.3	3.1	4.9	4.1
Slovakia	5.3	6.8	8.5	10.8	5.6	–5.4	5.0	2.8	1.7	1.5	2.8	4.2	3.1	3.2	4.0
Finland	3.9	2.8	4.1	5.2	0.7	–8.3	3.0	2.6	–1.4	–0.8	–0.6	0.5	2.8	2.7	1.6
Sweden	4.3	2.8	4.7	3.4	–0.6	–5.2	6.0	2.7	–0.3	1.2	2.6	4.5	2.7	2.1	2.2
United Kingdom	2.3	3.1	2.5	2.5	–0.3	–4.2	1.7	1.6	1.4	2.0	2.9	2.3	1.8	1.8	1.3

Source: Eurostat Warehouse Database (n.d.).

GG deficit is another variable in fiscal policy. The data on GG deficit in the EU countries that are presented in Table 5 cover the period between 2004–2018. The countries with the highest public deficit in the financial crisis in the EU are Greece, Portugal, Ireland, France, Latvia, Lithuania, Spain, and the United Kingdom. Additionally, in particular in 2014, also Cyprus, where the public deficit criterion (3%) was successively exceeded.

After the crisis period of 2008–2009, the number of countries that exceeded the limits of public deficit significantly increased. The countries with the lowest GG deficit in 2004–2018 were Estonia, Sweden, and Luxembourg. Countries that did not meet the Maastricht criterion for GG deficit in 2016–2017 include only Spain, France, and Malta. In 2018, all European Union countries recorded GG deficits below 3% of GDP (Maastricht criterion).

Finally, it is necessary to justify the expansionary fiscal policy in the crisis period in many EU countries, which limited the negative effects of the recession; however, these actions contributed to growing deficits and public debt in many countries, and as a consequence, they may cause inflationary pressure (van Riet A. 2010, pp. 7–34).

Table 5. GG deficit in % – percentage of GDP – selected fiscal policy variable

GEO/TIME	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Belgium	–0.2	–2.8	0.2	0.1	–1.1	–5.4	–4.0	–4.2	–4.2	–3.1	–3.1	–2.5	–2.4	–0.9	–0.7
Bulgaria	1.8	1.0	1.8	1.1	1.6	–4.1	–3.1	–2.0	–0.3	–0.4	–5.4	–1.7	0.2	1.1	1.8
Czechia	–2.4	–3.0	–2.2	–0.7	–2.0	–5.5	–4.2	–2.7	–3.9	–1.2	–2.1	–0.6	0.7	1.5	1.1
Denmark	2.1	5.0	5.0	5.0	3.2	–2.8	–2.7	–2.1	–3.5	–1.2	1.1	–1.5	–0.4	1.1	0.8
Germany	–3.7	–3.4	–1.7	0.2	–0.2	–3.2	–4.2	–1.0	0.0	–0.1	0.6	0.8	0.9	1.0	1.9
Estonia	2.4	1.1	2.9	2.7	–2.7	–2.2	0.2	1.2	–0.3	–0.2	0.7	0.1	–0.3	–0.4	–0.6
Ireland	1.3	1.6	2.8	0.3	–7.0	–13.8	–32.0	–12.8	–8.1	–6.1	–3.6	–1.9	–0.5	–0.2	0.1
Greece	–8.8	–6.2	–5.9	–6.7	–10.2	–15.1	–11.2	–10.3	–8.9	–13.2	–3.6	–5.6	0.5	0.8	1.0
Spain	0.0	1.2	2.2	1.9	–4.4	–11.0	–9.4	–9.6	–10.5	–7.0	–6.0	–5.3	–4.5	–3.1	–2.5
France	–3.6	–3.4	–2.4	–2.6	–3.3	–7.2	–6.9	–5.2	–5.0	–4.1	–3.9	–3.6	–3.5	–2.7	–2.5
Croatia	–5.2	–3.9	–3.4	–2.4	–2.8	–6.0	–6.3	–7.9	–5.3	–5.3	–5.1	–3.4	–0.9	0.9	0.3
Italy	–3.5	–4.1	–3.5	–1.5	–2.6	–5.2	–4.2	–3.7	–2.9	–2.9	–3.0	–2.6	–2.5	–2.4	–2.2
Cyprus	–3.7	–2.2	–1.0	3.2	0.9	–5.4	–4.7	–5.7	–5.6	–5.1	–9.0	–1.3	0.3	1.8	–4.4
Latvia	–0.9	–0.4	–0.5	–0.5	–4.2	–9.1	–8.7	–4.3	–1.2	–1.2	–1.5	–1.4	0.1	–0.6	–0.7
Lithuania	–1.4	–0.3	–0.3	–0.8	–3.1	–9.1	–6.9	–8.9	–3.1	–2.6	–0.6	–0.3	0.3	0.5	0.6
Luxembourg	–1.3	0.1	1.9	4.2	3.3	–0.7	–0.7	0.5	0.3	1.0	1.3	1.3	1.6	1.4	2.7
Hungary	–6.5	–7.8	–9.3	–5.0	–3.7	–4.5	–4.5	–5.4	–2.4	–2.6	–2.6	–1.9	–1.6	–2.2	–2.3
Malta	–4.3	–2.6	–2.5	–2.1	–4.2	–3.2	–2.4	–2.4	–3.5	–2.4	–1.7	–1.0	0.9	3.5	1.9
Netherlands	–1.8	–0.4	0.1	–0.1	0.2	–5.1	–5.2	–4.4	–3.9	–2.9	–2.2	–2.0	0.0	1.2	1.5
Austria	–4.8	–2.5	–2.5	–1.4	–1.5	–5.3	–4.4	–2.6	–2.2	–2.0	–2.7	–1.0	–1.6	–0.8	0.2
Poland	–5.0	–4.0	–3.6	–1.9	–3.6	–7.3	–7.3	–4.8	–3.7	–4.1	–3.7	–2.7	–2.2	–1.4	–0.2
Portugal	–6.2	–6.2	–4.3	–3.0	–3.8	–9.8	–11.2	–7.4	–5.7	–4.8	–7.2	–4.4	–2.0	–3.0	–0.4
Romania	–1.1	–0.8	–2.1	–2.7	–5.4	–9.1	–6.9	–5.4	–3.7	–2.2	–1.3	–0.7	–2.9	–2.9	–3.0
Slovenia	–2.0	–1.3	–1.2	–0.1	–1.4	–5.8	–5.6	–6.7	–4.0	–14.7	–5.5	–2.8	–1.9	0.1	0.8
Slovakia	–2.3	–2.9	–3.6	–1.9	–2.4	–7.8	–7.5	–4.3	–4.3	–2.7	–2.7	–2.6	–2.2	–0.8	–1.1
Finland	2.2	2.6	3.9	5.1	4.2	–2.5	–2.6	–1.0	–2.2	–2.6	–3.2	–2.8	–1.7	–0.7	–0.8
Sweden	0.4	1.8	2.2	3.4	1.9	–0.7	0.0	–0.2	–1.0	–1.4	–1.6	0.2	1.1	1.6	0.8
United Kingdom	–3.1	–3.1	–2.8	–2.6	–5.2	–10.1	–9.3	–7.5	–8.1	–5.4	–5.4	–4.2	–2.9	–1.8	–2.3

Source: Eurostat Warehouse Database (n.d.).

The interactions of variables from the monetary and fiscal policies in the EU countries

A negative correlation between GDP growth and short-term interest rate lagged by one year (IR (–1)), in accordance with the theory of economics that occurred in the discussed period in some EU countries. There is a high negative (statistically significant) correlation in most of the 28-EU Member States, apart from Ireland, Greece, Croatia, Cyprus, Latvia, Lithuania, and Hungary (where the correlations are not statistically significant). The lack of a statistically significant correlation between GDP growth and the interest rate lagged by one period may be related to the weak impact of monetary policy on economic growth in those countries and a stronger influence of other variables on economic growth.

Research on the monetary policy transmission mechanism in Poland indicates that the reaction of economic activity to a change in the short-term interest rate is the strongest and the fastest in the recovery phase of the economy, and the slowest and the weakest in a recession. The maximum reaction of the annual GDP dynamics occurs about half a year after the change in the interest rate – the GDP growth rate decreases between 0.1 and 0.3 percentage points (Chmielewski et al. 2018, p. 27). Thus, in countries where the recession phase lasted the longest or significantly affected the economic performance, the relationship between economic growth and the short-term interest rate could be weak, or it might not occur at all.

Table 6. Pearson's correlation ratios between selected monetary and fiscal policy variables in EU countries in 2004–2018

Country	d_GDP growth vs d_IR(–1)	d_GDP growth vs d_HICP	d_DEFICIT vs d_IR	d_DEFICIT vs d_HICP
Belgium	–0.8 (p=0.001)*	0.2	0.6 (p=0.019)	0.4 (p=0.127)
Bulgaria	–0.8 (p=0.001)	0.7 (p=0.003)	0.1	0.7 (p=0.004)
Czechia	–0.7 (p=0.003)	0.3	0.2	0.3
Denmark	–0.8 (p<0.001)	0.4 (p=0.191)	0.5 (p=0.061)	0.3
Germany	–0.8 (p=0.001)	0.5 (p=0.057)	0.8 (p=0.001)	0.6 (p=0.017)
Estonia	–0.6 (p=0.026)	0.4 (p=0.197)	–0.5 (p=0.034)	–0.2
Ireland	–0.3	0.0	0.3	0.5 (p=0.066)
Greece	–0.1	–0.1	0.3	0.4 (p=0.173)
Spain	–0.7 (p=0.006)	0.4 (p=0.162)	0.5 (p=0.078)	0.4 (p=0.191)
France	–0.9 (p<0.001)	0.5 (p=0.049)	0.8 (p=0.001)	0.6 (p=0.013)
Croatia	0.2	0.1	–0.2	0.4 (p=0.136)
Italy	–0.8 (p<0.001)	0.2	0.7 (p=0.003)	0.3
Cyprus	–0.4 (p=0.115)	0.3	0.4 (p=0.133)	0.2
Latvia	–0.4 (p=0.141)	0.2	–0.4 (p=0.190)	0.4 (p=0.136)
Lithuania	–0.2	0.2	–0.5 (p=0.091)	0.1
Luxembourg	–0.7 (p=0.003)	0.1	0.8 (p<0.001)	0.3
Hungary	–0.1	–0.1	0.4 (p=0.129)	0.6 (p=0.020)
Malta	–0.5 (p=0.048)	0.1	–0.2	–0.5 (p=0.049)

Country	d_GDP growth vs d_IR(–1)	d_GDP growth vs d_HICP	d_DEFICIT vs d_IR	d_DEFICIT vs d_HICP
Netherlands	–0.7 (p=0.005)	0.1	0.8 (p=0.001)	0.4 (p=0.191)
Austria	–0.7 (p=0.002)	0.7 (p=0.008)	0.7 (p=0.002)	0.7 (p=0.007)
Poland	–0.7 (p=0.010)	0.0	0.4 (p=0.150)	0.1
Portugal	–0.7 (p=0.008)	0.2	0.7 (p=0.005)	0.5 (p=0.076)
Romania	–0.7 (p=0.006)	0.3	–0.4 (p=0.144)	–0.1
Slovenia	–0.8 (p=0.001)	0.6 (p=0.033)	0.3	0.2
Slovakia	–0.5 (p=0.097)	0.0	0.6 (p=0.009)	0.4 (p=0.112)
Finland	–0.8 (p=0.001)	0.1	0.9 (p<0.001)	0.6 (p=0.026)
Sweden	–0.9 (p<0.001)	0.2	0.5 (p=0.055)	0.3
United Kingdom	–0.8 (p<0.001)	0.2	0.7 (p=0.005)	0.3

If p<0.1, the correlation is statistically significant
Source: own elaboration.

In the theory and practice of economics, the view is that high inflation and deflation adversely affect the dynamics of long-term economic growth. There are also views, such as from von Hayek, among others, about the beneficial, stimulating effect of slow inflation processes on the economic growth rate, although, only in the short term (von Hayek 2006, p. 323). In the case of the correlation between GDP growth and the HICP inflation rate, we note that a positive, statistically significant correlation occurred in the discussed period in Bulgaria, Germany, France, Austria, and Slovenia. Thus, in these countries, with inflation rising – GDP increased, or with falling inflation – GDP decreased.

Moderate inflation reduces the real costs of servicing public debt, so the threat to the budget may be an increase in interest rates, and unexpected changes in inflation through the impact on the level of fiscal policy may hamper economic policy (Cherif and Hasanov 2012, pp. 3–4). We note a statistically significant positive correlation between GG deficit (DEFICIT) and short-term interest rate (IR) in the vast majority of the EU countries during the period considered. This dependence turned out to be negative and statistically significant in Estonia and Lithuania. In the case of the correlation between GG deficit (DEFICIT) and the inflation index (HICP), this relation was positive and statistically significant in Bulgaria, Germany, Ireland, France, Hungary, Austria, Portugal, and Finland, whereas it was negative in Malta.

Analyzing the correlations of selected variables in the EU countries (which indicate many dependencies between the studied variables), we can also observe countries like Greece, Croatia, Cyprus, and Latvia without any statistically significant correlations between the selected pairs of variables. Ahrend et al. (2006) found that using real short-term interest rates (as a proxy for the monetary stance) and the cyclically-adjusted primary balance (as a measure of fiscal stance), correlations show that changes in fiscal and monetary stance do not seem to be correlated systematically, either positively or negatively. A partial exception is the United States, where the monetary and the fiscal policy stance seem to have moved mostly in the same direction over the past 25 years.

Conclusions

The crisis period had a negative impact on many economic variables in most European Union countries. As a consequence of the economic crisis in the EU countries, short-term interest rates even decreased to negative values; deflation occurred in many countries; much lower economic growths were recorded, and in many countries, unemployment and GG deficits increased significantly. Based on the correlation between variables in the area of monetary policy, i.e., (IR) and (HICP), and fiscal policy, i.e., (GDP growth) and (DEFICIT), in the European Union in the period between 2004 and 2018, it was noticed that there are statistically significant correlations between variables in the scope of the policy mix in many of the countries surveyed. This demonstrates that the interactions between monetary and fiscal policy are important for the economies of many countries. Therefore, it should be noted that the economic authorities making decisions in the sphere of monetary and fiscal policy interact with each other and thus affect the economy of a given country. Hence, the importance of properly conducting monetary and fiscal policies and their significance in economic processes in the EU countries should always be taken into account.

Considering the comparative aspects in the presented study, it should be emphasized that it is important that some countries that belong to both the EU and the euro area have an impact on the conduct of fiscal policy, while the monetary policy for these countries is conducted by the ECB. In turn, the EU countries that do not belong to the euro area conduct their own monetary and fiscal policies. This affects many relationships between the variables in monetary and fiscal policy. The following countries stand out: Belgium, Germany, Estonia, Spain, France, Italy, Luxembourg, Malta, the Netherlands, Austria, Portugal, Slovenia, Slovakia, and Finland (countries from the euro area). Meanwhile, Bulgaria, Czechia, Denmark, Poland, Romania, Sweden, and Great Britain (countries outside the euro area but in the EU) showed a negative correlation (statistically significant) between GDP growth and short-term interest rate lagged by one year. In countries such as Bulgaria, Germany, France, Austria, and Slovenia, a positive correlation (statistically significant) was noted between GDP growth and HICP.

Between 2004 and 2018, there is a positive, statistically significant correlation between the GG deficit and the short-term interest rate in countries such as Belgium, Luxembourg, Germany, the Netherlands, Austria, Portugal, Slovakia, France, Spain, Italy, Finland (countries from the euro area) and Denmark, Sweden and the United Kingdom (countries outside the euro area). A positive correlation (statistically significant) between GG deficit and inflation was recorded in the following countries: Germany, Ireland, France, Austria, Portugal, Finland (countries from the euro area), as well as in Bulgaria and Hungary (countries outside the euro area). Thus, in these countries, we note a statistically significant relationship between the examined variables in monetary and fiscal policy.

In countries such as Croatia, Cyprus, Greece, and Latvia, we do not see any statistically significant correlations in any of the four pairs of variables studied. This may be due to the fact that these countries pursued monetary and fiscal policy weakly correlated in the period considered. Greece was plunged into an economic crisis in 2008, so the Greek government's decisions were mainly focused on paying off the state's debts. Based on the correlations carried out, we can confirm the coexistence of the studied variables (in monetary and fiscal policies) in most EU countries (including the euro area). Although we are not able to state which variable is the cause and which is the effect, we can conclude with what strength the variables are related to each other, which is the added value of the research carried out.

Some limitations of the study should be pointed out. There is a complex system of economic and political integration in the EU countries, including the asymmetry of budget cycles or political cycles and associated election opportunism. The factors that disturb the relationships between variables in monetary and fiscal policies include the diverse objectives and preferences of the economic authorities, delays in implementing fiscal and monetary policy, as well as internal and external economic impulses, such as financial crises.

This provides an area for future analysis, especially as the correlation coefficient does not give information on which variables are dependent and which are independent – thus, it would be worth performing regression analysis between the selected variables, panel research, or Granger causality tests.

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Zależności pomiędzy zmiennymi z zakresu polityki monetarnej i fiskalnej w krajach Unii Europejskiej

Istota koordynacji polityki pieniężnej oraz fiskalnej (policy mix) opiera się na takiej kombinacji tych dwóch polityk gospodarczych, aby możliwe było osiągnięcie celów dotyczących zarówno stabilności cen, jak i wzrostu gospodarczego oraz zatrudnienia. Z kolei decyzje podejmowane w grze monetarno – fiskalnej władz gospodarczych w sposób istotny oddziałują na zmienne ekonomiczne w gospodarce. W literaturze ekonomii podkreśla się istotność koordynacji polityki monetarnej i fiskalnej co pozytywnie oddziałuje na stabilność gospodarki. Celem artykułu jest identyfikacja zależności pomiędzy zmiennymi z zakresu polityki fiskalnej i polityki monetarnej w istniejących warunkach ekonomicznych a następnie ich wpływ na gospodarkę w krajach UE. Do osiągnięcia postawionego celu wykorzystano następujące metody badawcze: przegląd literatury naukowej, prezentację danych statystycznych oraz statystyczne metody badawcze. Uzasadnieniem podjęcia danej tematyki jest zbadanie wpływu ostatniego kryzysu finansowo-gospodarczego na decyzje banków centralnych i rządów w krajach UE. Kryzys finansowy wpłynął na zmianę podejścia do prowadzenia polityki pieniężnej i fiskalnej. Zmieniające się warunki gospodarcze wymusiły podejmowanie wielu decyzji przez władze gospodarcze, które wpłynęły na interakcje pomiędzy bankiem centralnym a rządem w krajach UE. W wielu krajach UE w omawianym okresie zanotowano istotne współzależności pomiędzy zmiennymi z zakresu polityki pieniężnej i fiskalnej.

Słowa kluczowe: polityka fiskalna, polityka monetarna, koordynacja, Unia Europejska

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The European Union's Position in Global Foreign Direct Investment Flows and Stocks: Institutional Attempts to Improve It

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Abstract

Global flows of foreign direct investment (FDI) have slowed down in recent years, which particularly affected developed countries, including those in the European Union (EU). A general decrease in capital circulation in the form of FDI between the EU and the rest of the world has been observed. The aim of this paper is to assess the changes in the EU's position in global FDI flows and stocks and to discuss attempts made by EU institutions and the EU member states to improve this position. The EU can use the common investment policy to strengthen its investment position. The EU acquired the competence to conduct this policy based on the Lisbon Treaty, while its actual shape was determined in practice. Improving the EU's position in global FDI flows requires agreements regarding foreign investment, concluded at the EU level with other countries and integration groupings. Ensuring national treatment of investors before and after investing is important, as are solutions used for investor protection, investor-state-dispute-settlements (ISDS), and the use of investment project screening to protect strategic sectors of the EU economy. The EU investment policy can mitigate the effects of slowing down FDI flows, create a more favorable climate for outgoing FDI, and protect vital interests for FDI coming into the EU from third countries.

Keywords: foreign direct investment (FDI), European Union, investment policy

JEL: F2, F15, F21

Introduction

Global foreign direct investment (FDI) flows have shown limited growth since 2008 as a result of different determinants. The underlying FDI trend has averaged only 1 percent growth this decade, compared with 8 percent between 2000 and 2007, and more than 20 percent before 2000 (UNCTAD 2019, p. 5). The UNCTAD report points to the declining rates of return on FDI, increasingly asset-light forms of investment, and the less favorable climate as key drivers for the above-mentioned slowdown in FDI. The underlying trend was combined with long-term changes in geographical structures, both of global FDI flows and stocks. FDI flows to developed economies have reached their lowest level since 2004.

The European Union (EU), as a grouping, experienced a decline in FDI flows as well, which was determined by both external and internal factors. The Lisbon Treaty gives the EU's institutions new external competences, including FDI into the common trade policy. The EU has encountered some obstacles in introducing this provision of the Treaty. Nevertheless, the EU institutions have undertaken some measures related to FDI, which might have some impact on its position in the global economy in this field.

This paper aims to assess the changes in the EU's position in global FDI flows and stocks and to discuss attempts undertaken by EU institutions and the EU member states to improve this position. The hitherto worsening of the EU position in question can be analyzed in the context of a new phenomenon that has been observed in the world economy, namely de-globalization. This has been discussed in the literature (e.g., Della Posta 2018; Primo Braga 2018). However, analyzing the EU's position in global FDI flows and stocks in comparison with the positions of other integration groupings constitutes a new approach and provides a basis for a comparative assessment of the changing positions of the global leaders in this field. Furthermore, the analysis and the evaluation of the EU's common investment policy instruments give a chance to discuss some aspects of their effectiveness. Hence, the existing research gap can be filled to some extent.

The UNCTAD and Eurostat statistics databases were used to analyze and evaluate the changes in global FDI flows and stocks as well as between the EU and the third countries and integration groupings. The official information on the EU's policy towards foreign investment and independent analyses were used as a reference in the paper.

The position of the European Union in global foreign direct investment flows

Global capital flows in the form of foreign direct investment (FDI) have slowed down in the last decade, as outlined in the introduction. In 2018, the global inflows of FDI decreased and reached USD 1.3 trillion, i.e., 13% less than in the previous year (UNCTAD 2019, p. 1). It was the third year in a row in which a decrease in these flows was recorded. In addition to the decline in FDI flows, there were also other symptoms in the world economy (in the sphere of trade, financial globalization) that allowed researchers to ask questions about whether the peak globalization had been reached (Primo Braga 2018).

According to UNCTAD estimates, the decline in FDI flows in 2018 was due to the large-scale repatriation of foreign revenues accumulated by transnational corporations originating in the USA. It was a reaction to the tax reform introduced in the USA in 2017. The decline in FDI flows in 2018 would have been higher if not for the growing value of mergers and acquisitions taking place in the second half of the year (UNCTAD 2019, p. 1). Figure 1 presents the trends in global FDI inflows in 2008–2018.

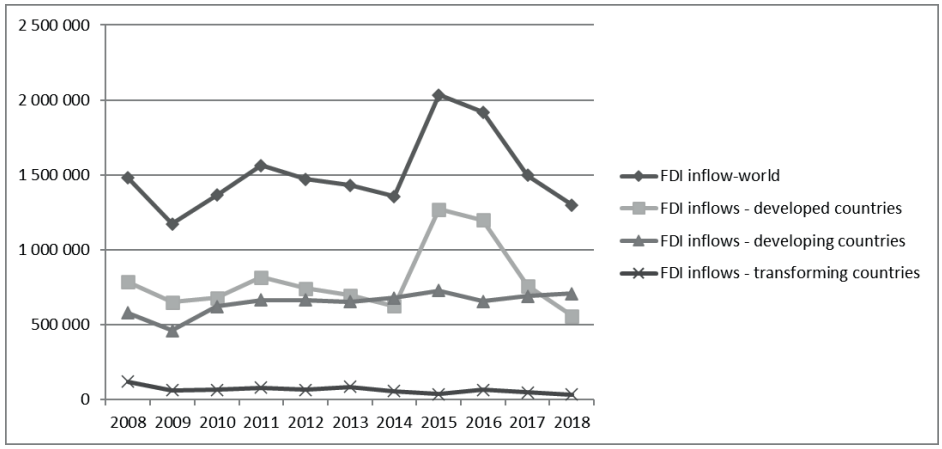

Figure 1. Foreign direct investment inflows, world and groups of countries, 2008–2018, USD million
Source: UNCTAD database (a) and own elaboration.

The preliminary data for 2019 for FDI flows in the global economy indicate a decrease of 1% from the revised global volume for 2018. However, the moderate or even marginal increase in FDI flows forecasted for 2020 (UNCTAD 2020, pp. 1–2) may not be achievable due to the consequences of the COVID-19 pandemic in the global economy.

The geographical structure of global FDI streams by the main groups of host countries indicates changes taking place in the longer term. FDI inflows to developed countries amounted to USD 556.8 billion in 2018, the lowest since 2004. FDI inflows

to Europe decreased by half, and several European countries (Switzerland, Ireland, Norway) recorded negative values due to the repatriation of funds by US transnational corporations. FDI inflows to Great Britain decreased, which was related to both the behavior of American investors and the ongoing process of Britain leaving the EU. The US also experienced reduced FDI inflows due to a 1/3 decrease in mergers and acquisitions. Australia, on the other hand, had record FDI inflows (USD 60 billion) as foreign subsidiaries reinvested USD 25 billion of profits in the economy (UNCTAD 2019, p. IX, 212). Preliminary data for 2019 show that total FDI inflows to developed countries decreased by another 6% compared to 2018 (UNCTAD 2020, p. 1).

Developing countries received investments of USD 706 billion in 2018, i.e., about USD 150 billion more than all developed countries. It meant that the share of developing countries in global FDI inflows was 54%, a record share. At the same time, FDI inflows to developing countries remained stable, showing a slight increase, i.e., by 2% (UNCTAD 2019, pp. IX, 2, 212, and own calculations). According to preliminary data, FDI inflows to developing countries in 2019 remained unchanged compared to the previous year (UNCTAD 2020, p. 2).

Figure 2 shows FDI inflows to major integration groupings in the global economy.

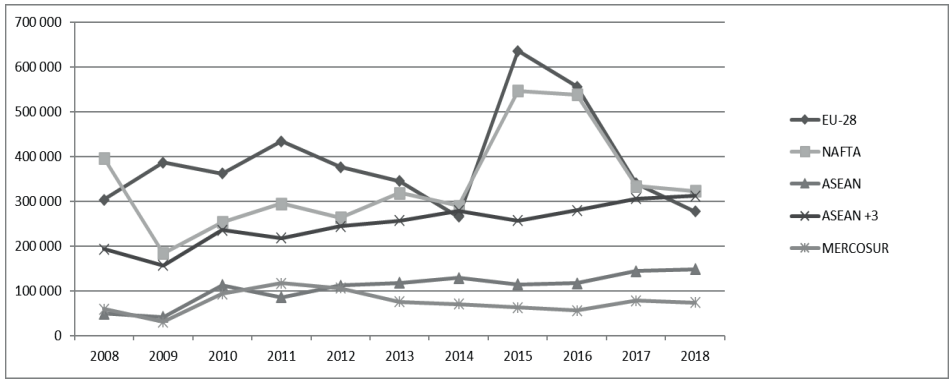

Figure 2. Foreign direct investment inflows to EU–28, NAFTA, ASEAN, ASEAN+3, Mercosur, 2008–2018, USD million
Source: UNCTAD database (a) and own elaboration.

UNCTAD data indicate that four analyzed groups jointly absorb 63% of the annual global FDI inflows. Two groups, i.e., the EU–28 and NAFTA, still attract more foreign investment than the other two analyzed groups, i.e., ASEAN and Mercosur. For the EU–28 and NAFTA, the trends are generally consistent with those observed in the global economy. However, the EU–28 is losing its investment attractiveness, while ASEAN is gradually gaining. If we include ASEAN+3 in the analysis, it turns out that EU–28, NAFTA, and ASEAN+3 take an almost equal position in global FDI capital inflows. However, the balance that emerged in 2018 is extremely fragile. FDI inflows to ASEAN +3 and ASEAN showed a relatively stable growing trend in the analyzed period. In contrast, inflows to EU–28

and NAFTA were subject to significant fluctuations in the last ten years. Mercosur, on the other hand, is unable to regain its position achieved after the 2008 crisis when inflows of over USD 100 billion to this grouping were recorded.

A comparison of the analyzed integration groupings in terms of their involvement in foreign direct investment indicates that FDI outflows from the EU–28 changed quite rapidly and did not reach the pre-crisis level throughout the entire analyzed period. In 2018, these streams equaled in absolute terms the FDI outflows from ASEAN+3. It is further evidence of a shift of the focus in this sphere of the global economy towards Asia. Although this process is mainly a result of the investment expansion of China and South Korea, the participation of ASEAN member countries in foreign direct investment flows is also visible. The drastic collapse of outflows from NAFTA seems to be reversible after the change in the US policy towards foreign investment.

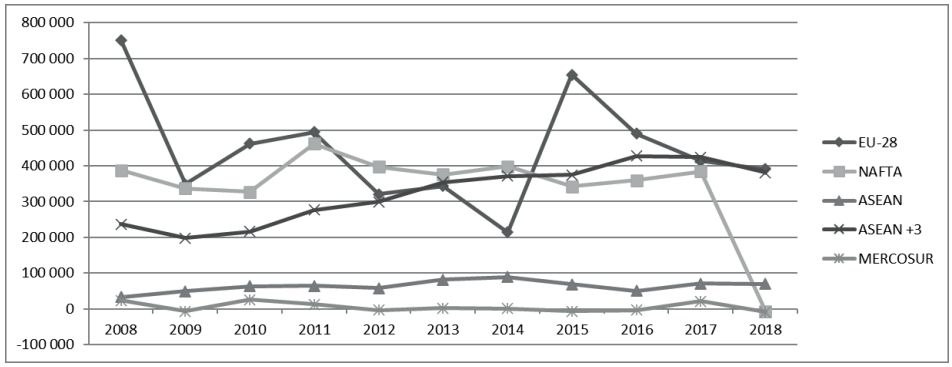

Figure 3. Foreign direct investment outflows from EU–28, NAFTA, ASEAN, ASEAN+3, Mercosur, 2008–2018, USD million
Source: UNCTAD database (a) and own elaboration.

The above statistical analysis of FDI flows in the global economy confirms the slowdown, which has been going on for four years. The cross-section of groups of countries, regions, and groupings revealed the strengthening of Asia, but also, in this case, a slight decrease in FDI outflows was recorded in 2018.

According to UNCTAD assessments, key factors that affect the long-term slowdown of global FDI capital flows include (UNCTAD 2019, pp. 5–6; UNCTAD 2020, p. 2):

- decreasing rates of return on foreign direct investment,
- increasing investor involvement abroad in elusive assets and the so-called non-proprietary forms of investments (e.g., licensing, production contracting),
- a less favorable investment climate, associated with high geopolitical risk and a shift towards protectionist policies.

The assessment of the EU's investment position requires taking into account its shares in global FDI inward and outward stocks. In 2018, these shares were 31% and 37%, respectively. (UNCTAD 2019, p. 216, and own calculations). In the case of FDI stocks, both inward and outward, the EU's investment position increased in absolute

terms by about four times compared to 2000. In relative terms, the EU's share did not change in the case of FDI inward stocks, even though the EU expanded by 13 new member countries during this period. On the other hand, the EU's share in FDI outward stocks decreased by 2 percentage points (in 2000, this share was 39%) (UNCTAD 2019, p. 216, and own calculations).

Characteristics of the European Union's FDI inflows and outflows

A more detailed analysis of the volume of annual EU FDI inflows and outflows shows that these flows decreased in absolute terms after the global financial crisis. Despite some positive changes, these flows did not regain the level of 2007. In 2018, they constituted only about 1/3 of the value of flows from before the crisis (UNCTAD database (b) and own calculations), as shown in Figure 4. Factors that affect the situation in global FDI flows also affected the EU's position as a whole. Like other developed countries, it experienced a further decline in FDI inflows in 2016–2018. FDI inflows to the EU decreased by 18.5% in 2018 compared to the previous year. In contrast, FDI outflows decreased by over 5% (UNCTAD database (b), and own calculations). Preliminary data for 2019 indicate a further decline in FDI inflows to the EU, i.e., by 15%, which had a negative impact on the position of all developed countries (UNCTAD 2020, p. 3).

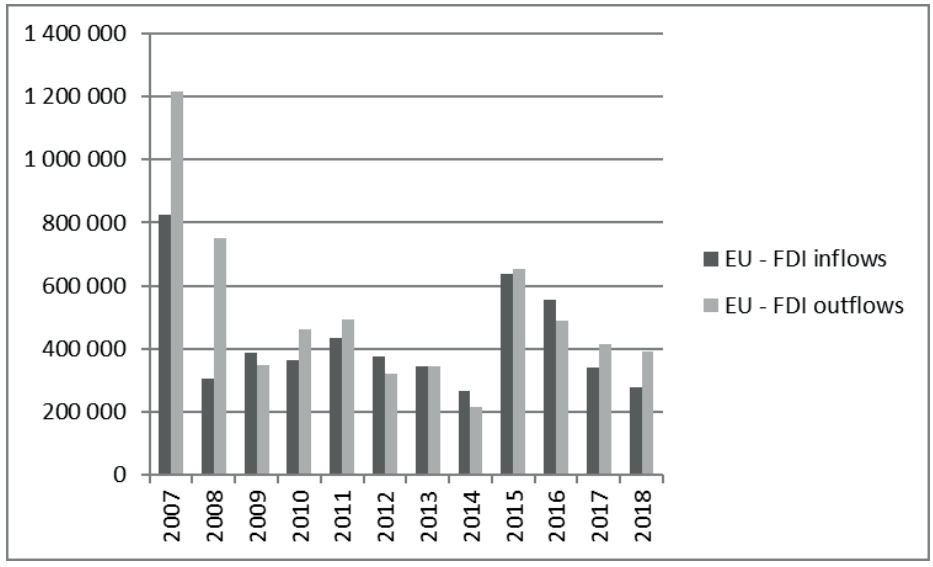

Figure 4. EU FDI inflows and outflows, 2007–2018, USD million
Source: UNCTAD database (b).

Compared to other regions in the global economy, FDI inflows to the EU dropped dramatically. In absolute terms, they amounted to only USD 278 billion in 2018, accounting for slightly above 1/5 of global FDI flows and less than 50% of FDI inflows to highly developed countries. Compared to the FDI inflows to developing countries, they were 2.5 times lower, and to developing Asia, almost two times lower (UNCTAD 2019, pp. 212–215, and own calculations).

The situation of individual EU member states in terms of FDI inflows remained varied. Half of them experienced a decline in FDI inflows in 2018, and two member states, Ireland (–66.3 billion USD) and Luxembourg (–5.6 billion USD), recorded divestments. The division into countries that experienced an increase in FDI inflows and countries with a decline in FDI did not follow the division into "old" and "new" member countries. However, among the ten EU member states with the highest FDI inflows in 2018, in addition to the "old" member countries, there were only two "new" member countries, i.e., Poland and Czechia. In turn, the most significant FDI outflows occurred in France, Germany, the Netherlands, Great Britain, and Spain. Three countries (Cyprus, Denmark, and Malta) showed divestments in that year (UNCTAD 2019, pp. 212–215 and own calculations). The share of 13 "new" member countries in the total FDI inflows to the EU was 17.6% in 2018. At the same time, these countries had a marginal share in total FDI outflows from the EU – 2.6% in 2018 (UNCTAD 2019, p. 212, and own calculations).

According to Eurostat assessments, FDI flows between the EU as a grouping and the rest of the world in 2018, i.e., excluding intra-EU flows, indicate a general decrease in the circulation of this capital between the EU and the rest of the world (Eurostat 2019). Adopting this approach, net FDI outflows from the EU to the rest of the world (the so-called extra-EU) were negative, according to preliminary data, at EUR 60 billion. This contrasts strongly with the positive result from the previous year (EUR 301 billion) (Eurostat 2019). Divestments from the EU market made by foreign investors from outside the EU (i.e., from the rest of the world) were approximately EUR 205 billion. It was almost equal to the amount of FDI inflows to the EU from the rest of the world in 2017 (EUR 265 billion) (Eurostat 2019).

The main reason for the above situation was the already mentioned serious divestments between the US and the EU, caused by adverse changes in the investment climate (tax regulations in the USA). It is estimated that US companies withdrew almost EUR 177 billion of net direct investment from the EU market, causing a downward trend in FDI inflows to the EU. Similarly, EU companies withdrew from the US market, with a net divestment of EUR –165 billion (Eurostat 2019). As a result, Switzerland and Canada became the EU's main external partners in FDI capital flows. Therefore, observations of high volatility and instability of FDI capital flows between the EU as a grouping and the rest of the world can be confirmed based on Eurostat databases.

The FDI flows are affected by one-off large mergers and acquisitions or the withdrawal of significant investors motivated by their own risk assessments, as well as by investment climate changes, not only in the host countries but also in investor home countries. The

EU member states must be ready to face rapidly changing and shrinking FDI flows. If the preliminary UNCTAD data for 2019 that indicate a further decline in FDI inflows to the EU by 15% are confirmed, it would mean a worsening of the EU's position in this respect (UNCTAD 2019, p. 1). Consequently, the question of the investment attractiveness of EU member states arises, especially compared to developing Asia.

In the context of deteriorating external relations in the sphere of FDI capital flows, intra-EU flows stimulated by the free movement of capital established within the framework of the single internal market are becoming increasingly important. In the case of the new EU member states, the inflows of FDI from other EU countries are dominant and decisive for their economies.

The European Union established the free movement of capital between member countries and in relations with third countries as a result of a long process to integrate the capital and financial markets of the EU member states. The current legal regulations are included in the Lisbon Treaty (TFEU 2012). The implementation of the Treaty allowed the free movement of capital within the grouping. It also liberalized the capital flows in relations with third countries, which allowed FDI flows to intensify.

Actions to strengthen the position of the European Union in global capital flows

The actions at the level of EU institutions taken in relation to foreign investors in a global context result from the extension of the EU's competence in this field. It refers to the common investment policy and its instruments, i.e., investment liberalization agreements and their protection in relations with third countries, investment dispute settlement methods, and screening FDI flowing into the EU.

Common investment policy

The entry into force of the Treaty on the Functioning of the European Union (Lisbon Treaty) changed the competences of EU institutions and member states concerning policy towards foreign investors. The Treaty gives the EU new competence in external relations, incorporating direct foreign investment in the common commercial policy (Art. 206), and it confirms the distribution of competences between the Union and the member states (Art. 207) (TFEU 2012).

The provisions of the Treaty are considered important, and they strengthen the EU's competences concerning external investments. However, at the same time, they are perceived as a "half-success" on the road to creating a common investment policy (Shan and Zhang 2010). However, according to some researchers, the way in which the provisions on the common investment policy were introduced into the Treaty on the Functioning of the European Union may negatively affect their implementa-

tion (Meunier 2017, pp. 593–610). Transferring competences in the field of investment policy from the national level to the EU level did not take place as a result of intergovernmental negotiations or the pressure of interest groups. It even took place against the preferences of the member states. It was the result of a specific combination of the neo-functional approach of the European Commission and its use of the circumstances (other, more important priorities for member states as part of a comprehensive and tense negotiation agenda on the TFEU). The lack of negotiations during the formulation of Treaty provisions regarding the transfer of these competences to the EU level resulted in a political debate in the implementation phase of the regulations regarding the common investment policy (Meunier 2017, pp. 593–610).

The problems that appear in the context of establishing a common investment policy seem to confirm the above theses. Controversial issues and disputes are related to:

- ensuring national treatment at the stage preceding investing abroad, i.e., granting pre-investment guarantees; in the newly negotiated free trade agreements with Singapore (2015), Canada (2016), and Vietnam (2016), the EU received the above guarantees for investors; however, in case of any conflicts, the implementation of the EU approach will depend on the goodwill of governments to settle disputes within the state-to-state-dispute-settlement mechanisms;
- investment protection, including Investor-State-Dispute-Settlements – ISDS; EU proposals to set up an international investment court have not received support from global partners;
- the so-called mixed agreements, which are thus named as they have to be accepted by both the EU and the member states; the free trade agreement with Canada, which followed this procedure, is an example.

The provisions of the Lisbon Treaty, which changed the competences of the EU institutions and the member states concerning policy towards foreign investors, are first and foremost relevant to the functioning of the free flow of investment within the EU. The relations between the rights of individual member states and the European Union require ordering and defining, particularly concerning intra-EU investment protection issues and incentives used by member states. It is important to provide investors with a high level of protection while recognizing the right of the EU and the member states to regulate markets when justified by public interest. Both the EU and the member states have the right to take appropriate legal measures that may have a negative impact on investment, but only under certain conditions and following EU law (COM 2018, p. 1).

Since the shift of competence concerning foreign investment causes legal disputes, the European Court of Justice (CJEU) has an important role to play in determining the final shape of the EU investment policy. The CJEU is expected to express its opinion on the legality of future *international investment agreements* (IIAs), the issue of compatibility of the Investor-State Dispute Resolution System (ISDS) with the EU's legal order. It should also answer the question regarding the extent to which new generations of EU trade and investment agreements can directly confer rights on private entities (Herrmann 2014, pp. 570–584).

Investment agreements between the EU and third countries

The EU has undertaken numerous negotiations on trade and investment agreements with external partners, which can be perceived as part of the implementation of investment policy. Concluded agreements and those currently being negotiated are either comprehensive cooperation agreements, which also include provisions regarding investments, or they are agreements aimed mainly at facilitating investments and their protection in mutual relations.

The agreement which is especially important for the broadening of the area of competence of the EU in relation to investment policy is The Comprehensive Economic and Trade Agreement (CETA) between Canada and the European Union, signed on October 28, 2016 (*Umowa gospodarczo-handlowa…*, n.d.). The provisions of the EU-Canada Agreement concerning the settling of disputes between investors and governments have been the subject of a CJEU ruling. This ruling sets a new standard in agreements currently being negotiated by the EU with other countries (CJEU, https://www.iisd.org/itn, accessed: 4.03.2020). The CETA provisions regarding investments relate to measures designed to increase investment flows between parties, protect investors, and ensure they are treated fairly by governments (*Umowa gospodarczo-handlowa…*, n.d.).

Another agreement that was important for clarifying the scope of the EU competence in investment policy is the free trade agreement with Singapore signed in October 2018, which entered into force on November 21, 2019 (*Is there an EU-ASEAN…*, 2019). According to the opinion of the CJEU 2/15 of May 16, 2017, on the EU competence to conclude an agreement with Singapore, the EU has exclusive power to determine the essential protection standards, usually included in investment protection agreements, concerning direct foreign investment. In contrast, the competence concerning portfolio investment and investor-to-state dispute resolution (ISDS) is one shared between the EU and the member states. All member states must ratify the investment protection agreement according to national procedures (EUR-LEX 2017; EC 2019a, p. 52; EC 2020).

Another agreement between the European Union and a developed country – a trade agreement with Japan – signed in July 2018 and adopted by the European Parliament, entered into force in February 2019. However, this agreement does not cover the issue of mutual investment. Negotiations on investment protection and investor-state dispute settlement are ongoing, but Japan does not accept the ICS solution (EC 2019a, p. 52; EC 2020, p. 2). At the same time, i.e., in June 2018, the European Union began negotiations with Australia and New Zealand on the conclusion of trade agreements. Future agreements will contain provisions on investment liberalization, while investment protection and investor-state dispute settlement issues are not negotiable (EC 2019a, p. 52; EC 2020, p. 4).

As part of relations with developed countries, in addition to the previously mentioned CETA agreement with Canada, the EU attempted to negotiate a comprehen-

sive partnership agreement with the USA, i.e., the Transatlantic Trade and Investment Partnership (TTIP). This agreement aroused many controversies in the societies of EU member states; this concerned, in particular, investor protection and dispute resolution. After a change in the political situation in the USA, negotiations were suspended.

The negotiations between EU and China on the signing of the Comprehensive Agreement on Investment (CAI) were vital for improving the EU's investment position in developing Asia. The negotiations began in 2014. The parties agreed on the scope of the future agreement in 2016, and they concluded in principle the negotiations in December 2020 (EP 2021; EC 2021). This agreement would replace 26 existing bilateral agreements between EU member states and China (EC 2020, p. 9). The scope of the CAI goes beyond the typical investment protection agreement. The issues for investors' access to the market (the national treatment of investors before investing in the host country's economy) are also included (EP 2019a). The agreement is expected to create favorable conditions for mutual direct investment flows and to bring positive effects for their economies in the future.

In relations with the developing countries of Latin America, the most significant EU achievement was the negotiation of an association agreement with the Mercosur grouping. Regarding the commercial part, an agreement was reached on June 28, 2019. However, negotiations are currently underway on liberalizing investment between the two integration groupings (EC 2019a, p. 53; EC 2019b). The European Union has also taken steps to modernize agreements with Mexico and Chile.

An analysis of international agreements concluded by the EU in terms of their geographical scope indicates an apparent expansion of the EU in negotiating and concluding agreements with all important EU partners. This activity should also be seen as a means of improving the position of the whole EU and its member states in global capital flows. The EU is making this effort in its relations with both developed and developing countries. The substantive scope of this activity includes the modernization or extension of existing contracts, the conclusion of new free trade and cooperation agreements in the field of investment, comprehensive cooperation, or partnership.

Settling disputes between investors and host countries

The problem of settling disputes between investors and host countries (ISDS) is so vital that global organizations, just like the European Union, are trying to solve it. Although an agreement on TTIP was not concluded, the discussion on problems related to settling disputes in investor-state relations brought new initiatives aimed at addressing this issue at the EU level. The European Commission's proposal, announced in 2015, involved the creation of a dispute settlement system in the form of an Investment Court System (ICS) (EC 2015; EP 2017a). In principle, the new system would be used

as a bilateral solution adopted in trade and investment agreements concluded by the EU on behalf of the member states.

The ICS organizational structure has two levels, i.e., the Tribunal, as the first instance, and the Appellate Tribunal, as the appeal instance. Unlike the system used in international arbitration, the parties will not be allowed to choose their arbitrators at the Tribunal. They will be selected on a rotational basis from a group of judges appointed by a joint committee established by a given agreement. The justification for starting the ICS procedure may be intentional discrimination of the investor on the grounds of sex, race, religion, nationality, expropriation without compensation, or refusal to grant justice. Moreover, the new system guarantees the governments of member states the right to introduce their regulations freely.

The ICS, proposed by the EU and introduced in the EU-Canada Agreement (CETA), can be seen as an attempt to create an arbitration system that is more transparent, convincing for societies, and safer for the member states. However, this proposal encountered strong social opposition (Menkes 2016, pp. 149–167; Witkowska 2017). In this case, the EU Court of Justice issued a binding opinion on June 27, 2019, recognizing that the inclusion of ICS provisions in the CETA agreement is compatible with EU law (CJEU 2019). The introduction of the new system should address social concerns regarding the right of member states to regulate.

The binding opinion of the CJEU on establishing a new investor-state dispute settlement system at the EU level can be seen as reaching the next stage in the implementation of the common investment policy within the EU. However, it is currently difficult to assess the impact of new systemic solutions on FDI flows within the EU and in relations with third countries. Over time, ICS practice will show whether public concerns about the limitations of member states' right to regulate or abstain from regulating these issues, which have involved ISDS international arbitration, will be dispelled. The development directions of the dispute resolution system at the global/international level also remain unresolved.

Regulations on a common framework for screening foreign direct investment flowing into the EU

The EU has taken action to establish a common framework for screening foreign direct investment flowing into the EU. Regulations regarding this issue entered into force in April 2019 (OJEU 2019). The general justification for the introduction of screening was the protection of the public interest in the context of the expansion of foreign investors from third countries in strategic EU sectors. The existing screening mechanisms in EU member states, implemented for reasons of national security, combined with procedures of checking the compliance of mergers and acquisitions with EU competition rules, were considered insufficient in a changing situation (EP 2017b, EP 2019).

The changes in capital flows between the EU and the rest of the world have been taking place for two decades, indicating the growing interest of investors from emerging economies in investing in EU member countries. This trend would not yet constitute the basis for introducing a new EU investment policy instrument in the form of FDI screening if not for the observed changes in the sectoral structure of these investments. Foreign investors are interested in investments in the high-tech processing industry. Investors mainly focus on strategic technologies, infrastructure, resources, and sensitive information (COM 2017). Moreover, FDI inflows in the form of mergers and acquisitions increased while *greenfield* investments were six times lower. In existing legal conditions, foreign investors could, therefore, gain control and influence strategic sectors in the EU economy using mergers and acquisitions as a way to enter the EU market.

According to the new regulation, member states may maintain existing FDI screening mechanisms,[1] change them, or adopt new mechanisms for reasons of security and public order (OJEU 2019). FDI screening is the sole responsibility of the member states. They have the exclusive right to decide on its mechanism and carry out the screening of individual investment projects. Countries that do not yet have such mechanisms are not obliged to implement them.

However, the EU regulation imposes basic common requirements concerning screening mechanisms and procedures carried out by member states, i.e., the principle of transparency of procedures, non-discrimination of investors, and the possibility of recourse against screening decisions. Measures are also required to prevent investors from circumventing applicable screening laws and decisions. The regulation introduces an indicative list of criteria that help the European Commission and member states determine whether a given FDI project may pose a threat to public security and order.

The monitoring procedure is not centralized, and the EU member states retain their competences in this respect. However, coordination mechanisms have been introduced between the European Commission and member states, including the obligation to exchange information between parties involved in the screening procedure, the obligation to clarify if the opinion of the Commission has not been taken into account, as well as the obligation to establish contact points by all EU member states and the Commission in order to implement the regulation.

Preliminary assessments of the potential effects of introducing the new regulation refer to the EU as a whole, individual countries, and third countries (Sunesen and Hansen 2018, pp. 42–44). It will result in additional administrative costs at the EU and member state level, while for foreign investors, it will involve adjustment costs and costs related to uncertainty and risk of investment delays. For some member states, this may result in limited access to capital, e.g., in the new EU member states.

1 Prior to the introduction of the EU regulation, 14 member countries had national FDI screening mechanisms, which differed in the manner and scope of functioning, cf.: EP 2019b.

The new regulations, assessed in the context of the emergence of the Union's common investment policy, indicate that initial efforts have been made at the EU level to create a new instrument of this policy. This instrument is potentially restrictive. Its use should safeguard the vital strategic interests of the EU and member states in the global economy. The introduction of a new screening system under the EU investment policy also seems to admit that the introduction of free movement of capital in relations between the EU and third countries may pose serious problems.

Conclusions

The EU remains a net FDI investor in the global economy. However, in recent years, there has been a general decrease in the circulation of FDI capital between the EU and the rest of the world, as well as the high volatility and instability of FDI capital flows in the case of individual EU member states.

Compared to other major investors in the global economy, the EU is losing its investment position. The investment attractiveness of the EU member states turns out to be much smaller than that of developing Asia.

For individual countries, in the context of deteriorating external relations in the field of FDI capital flows, intra-EU flows stimulated by the free movement of capital within the single internal market are of growing importance.

The EU is trying to strengthen the grouping's investment position in the global economy using the common investment policy established by the Lisbon Treaty. The division of competences between the EU institutions and member states is still a matter of dispute and emerges as a result of rulings of the CJEU.

EU institutions use the opportunities offered by the common EU investment policy. These are the inclusion of the issue of guarantees for the EU investors in concluded investment agreements with third countries, i.e., ensuring national treatment before investing, solving the problem of protecting foreign investment, which includes settling disputes between investors and host countries (ISDS).

The EU also creates a common screening framework for foreign direct investment flowing into the EU to protect the EU economies against losing control over strategic sectors, technologies, resources, and information.

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Pozycja Unii Europejskiej w globalnych przepływach bezpośrednich inwestycji zagranicznych: instytucjonalne próby jej poprawy

Globalne przepływy bezpośrednich inwestycji zagranicznych (BIZ) uległy w ostatnich latach spowolnieniu, a jego skutki są w szczególności odczuwane przez kraje rozwinięte, w tym przez Unię Europejską. Obserwowane jest generalne zmniejszenie cyrkulacji kapitału w formie BIZ w relacjach UE – reszta świata. Celem artykułu jest analiza zmian pozycji UE w globalnych bezpośrednich inwestycjach zagranicznych oraz ocena podejmowanych przez unijne instytucje wysiłków na rzecz poprawy tej pozycji. Unia Europejska wykorzystuje wspólną politykę inwestycyjną jako środek

służący poprawie jej pozycji inwestycyjnej. Unia uzyskała kompetencje do prowadzenia tej polityki na podstawie Traktatu z Lizbony, ale jej rzeczywisty kształt ustalany jest w praktyce. Z punktu widzenia osiągania celu, jakim jest poprawa pozycji UE w globalnych przepływach FDI, istotne są umowy zawierane na szczeblu UE z innymi krajami i ugrupowaniami integracyjnymi, w sprawie inwestycji zagranicznych, zapewniające narodowe traktowanie inwestorów przed i po podjęciu inwestycji w krajach trzecich, rozwiązania stosowane dla ochrony inwestorów i rozwiązywania sporów między inwestorami a krajami przyjmującymi oraz stosowanie monitoringu projektów inwestycyjnych w celu ochrony strategicznych sektorów gospodarki UE. Polityka inwestycyjna UE może z jednej strony łagodzić skutki procesów spowolnienia przepływów BIZ, stwarzając korzystniejszy klimat dla inwestycji lokowanych za granicą, a z drugiej strony chronić żywotne interesy gospodarcze UE w przypadku inwestycji napływających z krajów trzecich.

Słowa kluczowe: bezpośrednie inwestycje zagraniczne, Unia Europejska, polityka inwestycyjna

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Priorities for Greening and the Sustainable Development of OECD Member Countries and Ukraine: a Comparative Analysis

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Abstract

The article focuses on identifying priority areas for greening and sustainable development for OECD countries and Ukraine. They aim to achieve overall progress in the interaction between the economy and the environment. Additionally, the aim is to create prerequisites for encouraging innovation and investment to find new sources of economic growth that are compatible with ecosystems that are capable of recovering from damage. It has been demonstrated that although the global goals of greening economies are relevant for all countries, they must be tailored to the regional and national specificities, as well as each country's level of economic development.

The study used general qualitative and quantitative methods of economic research, including systematic, comparative analysis, methods of logical and statistical analysis, and index method, among others. The applied theoretical and methodological approach allowed us to identify general trends in the development of environmental factors in the OECD countries and Ukraine and their impact on economic growth. Specifically, the study analyzes the current state of affairs and perspectives for greening and sustainable development based on a comprehensive assessment of the level of greening in these economies and the relationship between the internal ecological environment – assessed using the indicators of "green growth" – and their economic development. The article also justifies priorities for greening and sustainable development and suggests practical measures for their implementation. They can serve as a basis for developing a policy of effective environmental management and elaborating a national system of environmentally friendly management and administration.

Keywords: global environmental problems, global environmental strategy, green growth, greening, priorities for greening and sustainable development

JEL: F55, O13, O44, O57, P51, Q56

Introduction

Identifying priority areas for greening and sustainable development must be based on a justified environmental strategy, which aims, first and foremost, to improve the current state of the global eco-economic space. As the environment where this environmental strategy is to be implemented is not stable, the strategy's function is to initiate well-timed changes that can increase the chances for sustainable development. Environmental strategies can be shaped at different levels: global, territorial (e.g., pan-European, pan-Asian, EU), regional (e.g., Danube valley) and national. Levels of national strategy can also be defined in terms of the national economy or business organization, namely: interdisciplinary (multi-sectoral strategy), specific (partial, limited strategies for influencing environmental and economic processes in various aspects) and functional (e.g., finance, education, innovation strategy).

In recent years, rapid and unpredictable changes in the economy have influenced the environment. Reconciling the interests of participants in socio-economic life and their long-term interest in protecting the environment at the macro level with short-term political and economic interests is becoming increasingly complex. Currently, only countries that are aware of these changes can assess their impact and take timely action caton adapt to external threats (United Nations 2018; New Atlas of the Green Economy 2019). That is why the successful implementation of an environmental strategy at the global level, as well as identifying priorities for greening and sustainable development, is largely determined not by financial means or the physical environment, but by the complex of environmental knowledge and environmental culture (Zerkalov 2013, p. 27).

The importance of a strategic vision when justifying priority areas of sustainable development greening is due to the increasing uncertainty and awareness of environmental deterioration, increasing the speed of change concerning both the environment and the economy, strengthening the effects of globalization. This, in turn, increases the demand for strategic international partnerships, the spread of regionalism processes worldwide, and the necessity to modernize the existing international system of relations (Dovgal and Panova 2018a, pp. 380–385). All this requires new methods to justify the environmental strategy for sustainable development.

The purpose of this article is to identify the priority areas of sustainable development greening and practical measures for their implementation for OECD countries and Ukraine, taking into account regional and national specifics, as well as the economic development level of each country. All this requires new methods to justify the environmental strategy for sustainable development. Specifically, there should be a comprehensive assessment of the economic greening level by calculating its greening index, based on the relationship characteristics of its internal ecological environment with its economic development, assessed by indicators of "green growth." The applied theoretical and methodological approach allowed us to identify the general trends in the development of environmental factors in the OECD countries and Ukraine and their impact on economic growth.

Literature review

This paper is related to several strands of literature. First, this article contributes to the literature that studies the evolution of nature and society's interaction concepts based on the research of problem areas such as the cost characteristics of the land of William Petty (Hull 1899, pp. 21–38), the emergence of global environmental crises under human influence (Malthus 1798, pp. 14–29), the world economy development modelling, which provides technological progress and economic growth restraint (Meadows et al. 1972, pp. 4–12; Meadows et al. 2007, pp. 5–16), and the development of international trade, taking into account the environmental factor (Anderson and Blackhurst 1992, pp. 12–35; Esty, 1994, pp. 9–28; Daly and Farley 2010, pp. 19–24).

Currently, from the standpoint of environmental and economic policy in the economic literature, two basic generalized models have been determined: a model of the front economy, which does not consider the scale of resources consumption concerning their reserves as the determining parameters of further system development, the primary factors limiting economic development; and the concept of environmental protection, which recognizes the necessity to consider the environmental factor, which is considered a factor that limits economic development (Kazakov et al. 2009, pp. 21–33; Svenningsen and Thorsen 2020, pp. 1–24).

To determine the level of environmental responsibility of countries, American ecologist Paul Ehrlich and physicist John P. Holdren (Ehrlich et al. 1977) proposed a meth-

odological approach to assessing anthropogenic environmental impact, according to which the environmental impact is associated with the country's level of economic welfare. The development of this direction in the economic literature led to the appearance of the term' ecological footprint' as an indicator of the intensity of human negative impact on the environment, as calculated in hectares of land per capita (Wackernagel et al. 2004, pp. 293–315; Kitzes et al. 2007, pp. 1–4; Wackernagel et al. 2019).

In the scientific developments of the late twentieth century ecosystem concept is reflected in the study of assimilation potential, which implies the ability of the ecosystem to absorb harmful impurities without significant consequences for its equilibrium (Ignatov et al. 1999, pp. 32–51).

Weizsäcker, Lovins, and Lovins (1995) proposed the "Factor Four" concept, which provides a 4-fold increase in resource productivity. They later produced "Factor Five", to achieve an 80% increase in resource efficiency, specific technologies and solutions. They also demonstrated ways of scaling these solutions and technologies globally, to change the economic system in favor of solving the problems of climate change, fresh water deficit, hunger, and waste (Weizsäcker et al. 2010).

Modern developments towards identifying and solving the problems of environmental management and the greening process are based on theoretical and methodological studies by researchers such as Colby (1989), Huber (1991), Blanc et al. (2008, pp. 251–260), among others. The sustainable development of modern civilization and the population's quality of life are directly related to insufficient energy supply (Matyushenko et al. 2015, p. 9). To solve the contradictions between economics and nature, Banerjee et al. (2016) proposed an approach to analyze policy impacts on the economy and the environment in a quantitative, comprehensive, and consistent framework.

We agree with most economic and environmental experts (Rogers et al. 2006, pp. 12–31; Podlesnaya 2012, pp. 208–212; Wiesmeth 2012, pp. 5–14; Anderson 2013, pp. 7–19; Reznikova 2016, pp. 23–26; Jackson 2017, pp. 4–49; Škrinjarić 2020, pp. 72–108) that the greening process, as a tool to ensure environmental safety and achieve the sustainable development of eco-economic production systems, is necessary and the only right way to solve this problem. However, it should be noted that, at present, there is a great need to develop ecological and economic system development concepts that will sustainably develop civilization and, at the same time, ensure economic growth and ecological balance in the world.

Materials and methods

The article suggests a scientific and methodological approach to determining the hierarchical structure of the system of strategic goals, and identifying priority areas for greening and sustainable development (Figure 1).

In order to successfully implement an environmental strategy in the process of greening and sustainable development, it is important to develop a realistic vision

of it, explain it to stakeholders in every detail, make it appealing to them, and ensure that certain actions are taken within the framework defined by this vision. At the same time, it involves choosing the overall direction of sustainable development by disclosing the system of values, and with the participants' active involvement and aptitude for risk-taking in the process of implementing an environmental strategy.

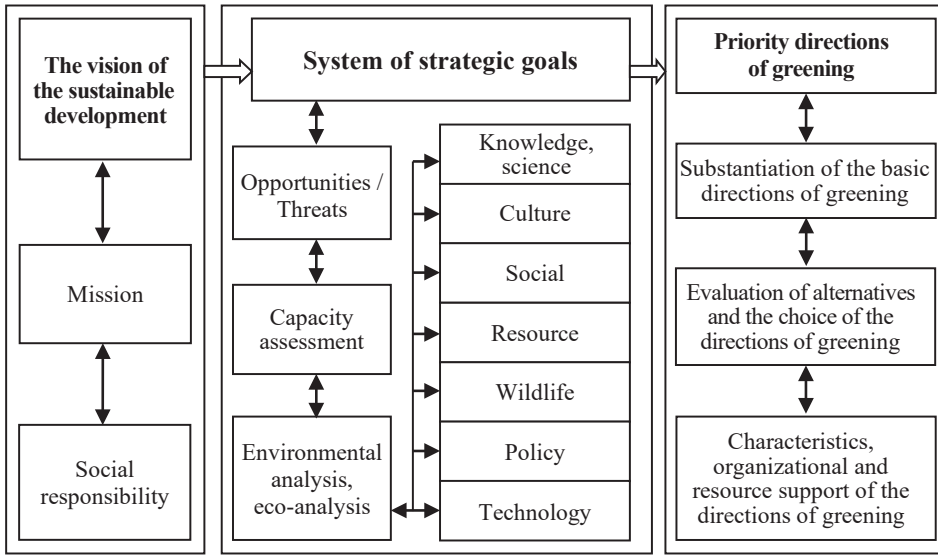

Figure 1. Determining the hierarchical structure of the system of strategic goals and identifying priority areas for greening and sustainable development
Source: Global Goalscast 2018; United Nations 2018.

The vision for sustainable development also outlines areas for innovation. Sustainable development, in line with OECD recommendations, is defined in terms of "green growth", namely "the introduction of means to foster economic growth and development as well as ensure the preservation of the natural assets on which the welfare of mankind depends" (OECD 2018). Green growth itself should be a catalyst for investment and innovation, which will lay the foundations for sustainable development, creating new economic opportunities. In formulating the principles of green growth, the OECD relied on a number of analytical studies and political efforts to ensure sustainable development. That is why these environmental and economic growth benchmarks have been chosen in our work to justify our vision of priority areas for sustainable development (United Nations 2018; Sustainable Development Report 2019; United Nations 2019; World Resources Institute 2018).

The system of strategic goals for greening and sustainable development has a hierarchical structure that we have characterized as follows: the upper level is a system of global greening goals; the second one includes a system of national goals; the third one contains a system of goals in specific areas of greening. Sustainable development

and greening are achieved by balancing various levels of certain aspects of economic, environmental and social policies reflected in their goals, with a focus on the conservation and restoration of ecosystems in the process of economic development. Thus, they should be directed at developing and implementing the resource-efficient management of sustainably developing production and consumption (Dovgal and Panova 2018b, pp. 109–114). Global sustainable development goals in the context of tendencies and prospects of aggravating global environmental problems are summarized and described in Table 1.

Table 1. Global sustainable development goals

Global environmental problems	Global goals of the greening process
The impact of harmful emissions from modern industry exacerbates the environment	Reducing the economy's carbon intensity and enhancing its resource efficiency by increasing environmental friendliness and resource productivity
	Conserving natural resources
The consumption of natural resources increases, which can lead to their scarcity and the reduction of biodiversity	Increasing economic opportunities by taking appropriate measures for long-term use and restoration of natural resources
The environmental impact of industry leads to the deterioration of health and environmental aspects of the quality of life of the world's population	Improving environmental aspects of the quality of life

Source: Global Goalscast, 2018; United Nations, 2018.

To identify priorities for greening and sustainable development, we have comprehensively assessed how green the economy of a country is by calculating the greening index based on the relationship between its internal ecological environment and economic development, measured in terms of "green growth" indicators proposed by the OECD (OECD 1990–2018). Since the OECD database on "green growth" generates data and figures for the 1990–2018 period over a wide range (128 indicators for 46 OECD member countries, 153 non-OECD countries, and some other groups of countries), this study has used 17 key indicators for the 14 leading OECD countries according to these indicators, plus Ukraine (Table 2).

Table 2. Green Growth Indicators (OECD) used in the study

Variable			Unit	Legend
Environmental and resource productivity	CO_2 Productivity	Production-based CO_2 productivity, GDP per unit of energy-related CO_2 emissions	Number, 2010	X_1
	Energy productivity	Energy intensity, Total primary energy supply per capita	Tonnes of oil equivalent (toe)	X_2
		Renewable electricity, % total electricity generation	Percentage	X_3
		Non-energy material productivity, GDP per unit of domestic material consumption	US dollars per kilogram, 2010	X_4
	Non-energy material productivity	Biomass, % of domestic material consumption	Percentage	X_5
		Non-metallic minerals, % of domestic material consumption	Percentage	X_6
		Metals, % of domestic material consumption	Percentage	X_7
		Municipal waste generated, kg per capita	Kilograms per capita	X_8
		Municipal waste recycled or composted, % treated waste	Percentage	X_9
Natural asset base	Forest resources	Forest resource stocks	Cubic meters, Millions	X_{10}
Environmental dimension of quality of life	Exposure to environmental risks	Mean population exposure to current air quality standards for fine particulate matter ($PM_{2.5}$)	Micrograms per cubic meter	X_{11}
		Mortality from exposure to ambient quality standards for fine particulate matter ($PM_{2.5}$)	Per 1,000,000 inhabitants	X_{12}
		Welfare costs of premature mortalities from exposure to ambient quality standards for fine particulate matter ($PM_{2.5}$), GDP equivalent	Percentage	X_{13}
Economic opportunities and policy responses	Technology and innovation: Patents	Development of environment-related technologies, % all technologies	Percentage	X_{14}
		Development of environment-related technologies, inventions per capita	Number	X_{15}
	Environmental taxes and transfers	Environmentally related taxes, % GDP	Percentage	X_{16}
		Environmentally related taxes, % total tax revenue	Percentage	X_{17}

Source: OECD 1990–2018.

The study uses the index method, which makes it possible to assess how close (far) each of the 14 countries is to the benchmark (the best value of all analyzed countries), which is taken as 100%. The following parameters are then converted as a percentage using the formulas (Yashalova 2015, pp. 67–75; Yashalova and Ruban 2016, pp. 219–237):

$$K_i = \frac{X_i}{X_{\max}} \cdot 100 \quad \text{or} \quad K_i = \frac{X_{\min i}}{X_i} \cdot 100 \tag{1}$$

where i is the country's number; X_i is the parameter value for the i-th country; $X_{\max}$, $X_{\min}$ is the best parameter value; and K_i is the assessment of the development level of the i-th country using the relevant parameter.

Based on the specific values of all the indicators for each component of the greening process in a certain country, the average value of its greening index (GI) is determined using the formula (Yashalova 2015, pp. 67–75):

$$\text{GI} = \frac{1}{n} \sum_{i=1}^{n} K_i \tag{2}$$

The comparison of the environmental status of countries using a rating scale with a range from 0 to 100 (thus, the higher the Greening Index (GI) is, the higher the level of environmental status is) with the indicator describing economic development (average annual GDP growth rate (Knoema Corporation 2018)) provides a matrix to identify priority areas for greening and sustainable development across the four groups of countries, giving each one practical guidance on how to implement these priorities.

The priority areas and practical measures for greening and sustainable development of the OECD countries and Ukraine

The results of calculating the median value of the GI over the 1990–2018 period for 14 OECD countries and Ukraine using the above method are presented in Table 3.

To determine the goals and priorities for greening and sustainable development for the four groups of countries, we developed a matrix based on the index method presented in Figure 2.

Table 3. Indicators for assessing the average level of the Greening Index for 14 OECD countries and Ukraine, 1990 vs 2018

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}	X_{15}	X_{16}	X_{17}	Greening Index, average level
Sweden	100.0	74.4	94.5	31.9	92.3	67.5	87.0	74	67.1	7.3	100.0	100	30	4.3	60.3	3.4	6.2	76.49
Japan	35.3	49.6	24.4	100.0	35.3	87.7	52.3	100	100.0	11.5	51.7	56	54	84.1	88.9	100.0	42.4	64.96
Denmark	66.6	43.2	100.0	35.1	82.6	88.3	7.5	43	67.2	0.3	59.2	54	55	4.1	98.5	20.3	17.6	59.29
Republic of Korea	26.0	82.7	4.7	51.1	88.4	95.7	55.8	87	32.2	2.3	24.4	61	50	37.4	100.0	4.0	12.8	58.20
United Kingdom	58.6	40.5	40.9	90.0	79.7	79.6	10.1	72	47.5	1.6	58.7	57	53	13.7	28.4	3.7	9.0	57.71
France	72.1	56.1	29.2	60.5	74.1	85.2	10.7	66	45.2	7.2	51.3	74	42	18.7	39.2	7.6	91.5	55.44
Germany	41.6	56.4	48.4	59.5	93.1	88.1	17.1	53	39.3	9.0	50.7	43	69	48.6	80.4	7.8	100.0	55.18
Ireland	67.7	43.9	41.2	49.1	81.0	69.4	33.0	57	37.9	0.3	74.1	92	30	0.5	15.8	2.4	8.0	53.40
Italy	53.5	37.8	62.0	76.6	51.1	84.9	15.3	68	26.6	3.4	37.2	44	71	7.8	17.7	12.8	20.8	52.86
Spain	54.3	38.5	63.8	68.9	60.3	67.7	31.5	73	16.4	3.0	61.9	67	47	3.3	9.7	2.8	6.7	52.70
Czech Republic	27.2	58.3	18.9	44.6	82.4	100.0	21.8	99	22.2	1.9	37.8	35	91	0.5	6.7	3.3	7.7	52.67
Mexico	39.7	21.6	25.3	27.4	97.7	46.0	100.0	98	7.5	11.6	28.9	76	44	0.5	0.5	2.5	11.5	51.50
Hungary	47.1	39.1	16.7	36.7	100.0	80.0	7.7	87	20.6	0.9	38.1	34	100	0.4	6.3	4.2	8.4	48.36
United States	30.0	100.0	24.5	53.6	8.2	72.3	46.7	45	16.4	100.0	83.3	74	39	100.0	42.3	1.0	3.1	44.12
Ukraine	13.8	31.5	9.4	17.4	8.8	44.6	7.2	57	15.3	21.9	30.3	19	16	0.3	1.0	1.4	3.5	22.82

Source: OECD 1990–2018; *Report on Green Transformation in Ukraine* 2016; Green Growth Knowledge Platform 2000–2017; *Greening Economies...* 2018; Green Economy Options for Ukraine 2018.

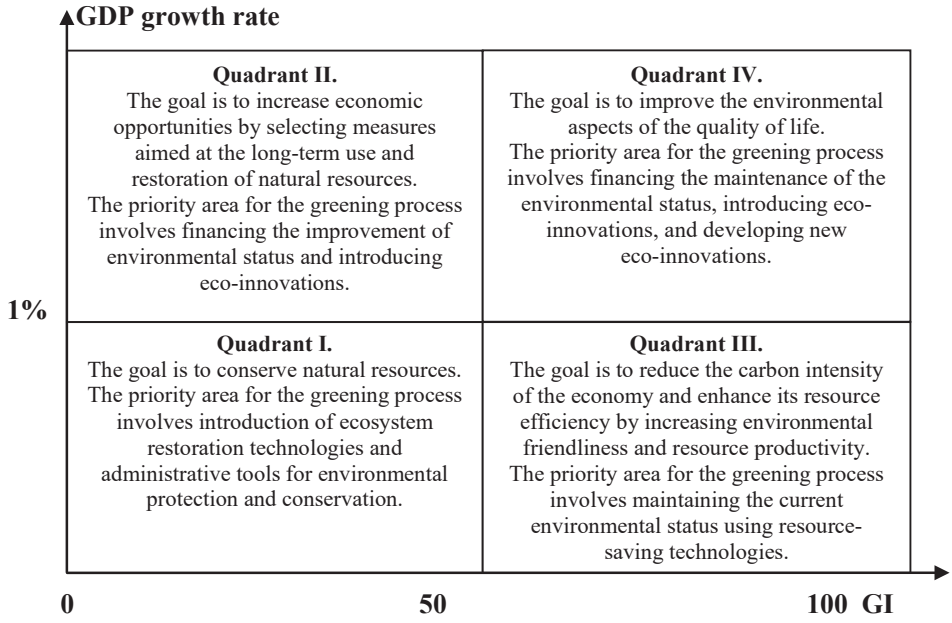

Figure 2. The matrix for identifying priority areas for greening and sustainable development
Source: authors' own elaboration based on Yashalova (2015).

Quadrant I includes countries with a GI value of less than 50.0 and an average annual GDP growth rate of up to 1%, thus specifying the introduction of ecosystem restoration technologies and administrative tools for environmental conservation as their priorities for the greening process. Quadrant II encompasses countries with a GI value of less than 50.0 and an average annual GDP growth rate of more than 1%, which calls for financing environmental improvements and introduction of eco-innovations. Quadrant III includes countries with a GI value of over 50.0, and an average annual GDP growth rate of less than 1%. Their priority area for the greening process is maintaining the current environmental status using resource-saving technologies. The countries falling into quadrant IV – with a GI value of more than 50.0 and an average annual GDP growth rate of more than 1% – are advised to finance the maintenance of their environmental status, introduce eco-innovations and develop new eco-innovations.

In our opinion, the main measures for the implementation of the priority areas for greening and sustainable development should primarily focus on introducing incentives to increase resource and natural asset efficiency. This will contribute to improving productivity, spreading eco-innovations, opening new markets for eco-products, attracting investors, and improving socio-economic stability. It should include promoting efficient resource management and the reduction of waste and energy consumption. It reflects not only how much energy is utilized in the economy but also the changes in energy consumption across sectors (Setyawan 2020, p. 394). It will thus ex-

pand the range of eco-innovation opportunities by taking certain political measures and developing a framework to spread new production technologies aimed at addressing environmental issues. It will also create new international markets for eco-products by stimulating demand for environmentally-friendly technologies, products and services, and increase employment opportunities in the environmental field in different countries.

At the same time, it is necessary to understand that all these measures should be implemented in the context of increasingly scarce and deteriorating resources scarcity, as well as the increasing cost of investment and capital intensity of infrastructure. Therefore, the problems that arise in the process of greening and sustainable development should be solved only using the innovative potential of the modern economy. It is viewed as a country's set of scientific, technological, financial, economic, industrial, social, cultural, and educational capacities in the field of environmental protection and restoration, the efficient use of natural resources, improving productivity in the environmental field, and reducing resource intensity required to ensure sustainable development.

That is why, in our view, implementing the identified priority areas for greening and sustainable development requires taking both economic and environmental measures, including:

1. Economic measures:
   – increasing GDP, enhancing production efficiency, and creating new improved products to be used as a material basis for the development of the greening process;
   – implementing structural changes in the economy that lead to the emergence of new sectors, products, and services and that can eliminate the problem of technological deadlocks, especially regarding infrastructure;
   – ensuring financial consolidation by reviewing the composition and efficiency of public expenditure and raising revenues with adequate pollution charges, among others;
   – ensuring investor confidence by improving the predictability and stability of public policy on key development and environmental issues;
   – ensuring balanced macroeconomic conditions and stable resource prices;
   – economic diversification, reducing environmental impact, and mitigating natural hazards/risk management by means of eco-innovation;
   – introducing innovative and resource-efficient technologies of production and consumption, and the use of "green" technologies;
   – raising incomes and the quality of life, reducing inequities in access to natural resources.
2. Environmental measures:
   – regular monitoring of the environmental status;
   – introducing ecosystem and biodiversity restoration technologies;

– increasing the productivity and efficiency of natural resource use and waste management;
– energy saving thanks to closed cycle manufacturing;
– improving the use of natural and other types of capital within environmental limits with the help of non-renewable natural capital.

Based on the Greening Index calculation and comparing it with the GDP growth rate, we have classified all the analyzed countries into four quadrants. We have also provided practical guidance on implementing priority areas for greening and sustainable development (Table 4).

Table 4. Classification of countries based on the calculations of their greening index and average GDP growth rate and guidance on implementing priority areas for greening and sustainable development

Priority areas for greening	Countries	Practical guidance
Quadrant I . Implementing ecosystem restoration technologies and administrative tools for environmental conservation	Ukraine	– regularly monitor the environment status; – introduce ecosystem and biodiversity restoration technologies; – ensure financial consolidation by reviewing the composition and efficiency of public expenditure and raising revenues with adequate pollution charges, among others; – ensure investor confidence by improving the predictability and stability of public policy on key development and environmental issues; – ensure balanced macroeconomic conditions and stable resource prices; – reduce environmental impact and natural hazards mitigation/ risk management
Quadrant II . Financing improvement of environmental status and introduction of eco-innovations	Hungary, United States	– introduce ecosystem and biodiversity conservation technologies; – raise revenues with adequate pollution charges; – introduce innovations and structural changes in the economy that lead to the emergence of new sectors, products, and services and that can eliminate the problem of technological deadlocks, especially concerning infrastructure; – ensure investor confidence by improving the predictability and stability of public policy on key development and environmental issues; – ensure balanced macroeconomic conditions and stable resource prices; – reduce environmental impact and mitigate natural hazards/ risk management
Quadrant III . Maintaining the current environmental status using resource-saving technologies	Italy	– regularly monitor the environment status; – introduce ecosystem and biodiversity restoration technologies; – introduce innovative and resource-efficient technologies of production and consumption, use «green» technologies; – reduce environmental impact and mitigate natural hazards/ risk management

Priority areas for greening	Countries	Practical guidance
Quadrant IV . Financing maintenance of the environmental status, introduction of eco-innovations and development of new eco-innovations	Sweden, Japan, Denmark, Republic of Korea, United Kingdom, France, Germany, Ireland, Spain, Czech Republic, Mexico	– increase productivity and the efficiency of natural resource use; – improve the use of natural and other types of capital within environmental limits with the help of non-renewable natural capital; – raise funding for environmental research and eco-innovation; – economic diversification, i.e., improve economic risk management by introducing eco-innovation; – introduce innovative and resource-efficient technologies of production and consumption, use «green» technologies; – reduce environmental impact and mitigate natural hazards/ risk management

Source: author's development.

Thus, Ukraine falls into quadrant I, with an average GI value of 22.82 and an average annual GDP growth rate of 0.3% between 1990 and 2017. Quadrant II includes two of the studied countries: Hungary (GI – 48.36, average annual GDP growth rate – 2.0%) and the USA (GI – 44.12, average annual GDP growth rate – 2.4%). Quadrant III includes Italy (GI – 52.86, average annual GDP growth rate – 0.7%). Finally, quadrant IV encompasses most of the analyzed countries: Sweden (GI – 76.49, average annual GDP growth rate – 2.65%) , Japan (GI – 64.96, average annual GDP growth rate – 1.9%), Denmark (GI – 59.29, average annual GDP growth rate – 1.85%), Republic of Korea (GI – 58.20, average annual GDP growth rate – 4.55%), UK (GI – 57.71, average annual GDP growth rate – 2.0%), France (GI – 55.44, average annual GDP growth rate – 1.7%), Germany (GI – 55.18, average annual GDP growth rate – 2.37%), Ireland (GI – 53.4, average annual GDP growth rate – 7.0%), Spain (GI – 52.7, average annual GDP growth rate – 2%), the Czech Republic (GI – 52.67, average annual GDP growth rate – 1.67%), Mexico (GI – 51.5, average annual GDP growth rate – 2.58%).

We believe that to conserve natural resources, the priorities for greening and sustainable development in Ukraine should include the introduction of ecosystem restoration technologies and administrative tools for environmental conservation through regular environmental monitoring. It should also ensure financial consolidation by reviewing the composition and efficiency of public expenditure and increase revenues with adequate pollution charges. Additionally, it should ensure investor confidence by improving the predictability and stability of public policy on key development and environmental issues, ensuring balanced macroeconomic conditions and stable resource prices. Finally, it should reduce environmental impact and mitigate natural hazards/risk management.

Regarding Hungary and United States, the main goal is to increase economic opportunities by selecting measures for the long-term use and restoration of natural resources. Therefore, the priority areas for greening should include financing the environmental status improvement and introducing eco-innovations. This can be done

by implementing ecosystem and biodiversity conservation technologies; raising revenues with adequate pollution charges; introducing innovations and structural changes in the economy that lead to the emergence of new sectors, products, and services, and that can eliminate the problem of technological deadlocks, especially regard infrastructure; ensuring investor confidence by improving the predictability and stability of public policy on key development and environmental issues; ensuring balanced macroeconomic conditions and stable resource prices; and reducing environmental impact and mitigating natural hazards/risk management.

For Italy, the main goal is to reduce the carbon intensity of the economy and enhance its resource efficiency by increasing environmental friendliness and resource productivity. This means that its priority areas for greening should include maintaining the current environmental status with resource-saving technologies through regular environmental monitoring, introducing ecosystem and biodiversity restoration technologies, introducing innovations, and using "green" technologies, as well as reducing environmental impact and mitigating natural hazards/risk management.

Finally, with a view to improving the environmental aspects of the quality of life in countries such as Sweden, Japan, Denmark, the Republic of Korea, the UK, France, Germany, Ireland, Spain, the Czech Republic, and Mexico, the priorities of greening and sustainable development include financing the maintenance of the environmental status, introducing eco-innovation and developing new eco-innovations by increasing the productivity and efficiency of natural resource use, improving the use of natural and other types of capital within environmental limits using non-renewable natural capital, raising funding for environmental research and eco-innovation, economic diversification, i.e., improving economic risk management with introducing eco-innovation, introducing innovative and resource-efficient technologies of production and consumption, using "green" technologies, and reducing environmental impact and mitigating natural hazards/risk management.

Thus, the priority areas for greening and sustainable development and the measures for implementing them should match both their current environmental status and the level of economic development. Finally, effective and strict international environmental protection laws should be adopted worldwide (Singh et al. 2019, p. 87). The European financial market, whose participants are mainly from developed countries, has already begun to implement environmentally friendly regulations (Janicka 2016, p. 35).

Conclusion

Identifying priority areas for greening and sustainable development must be based on a reliable environmental strategy primarily aimed at improving the current state of the global ecological and economic space. The global system of strategic goals of greening and sustainable development has a hierarchical structure. The upper level features a system of global greening goals, the second level includes a system of national goals, and the third level contains a system of goals in specific areas of green-

ing. Although global greening goals are relevant to all countries, they must be tailored to the regional and national specificities, as well as each country's level of economic development, which was stated as the research purpose and that was proved as a result of the study.

Our findings could have direct implications in terms of countries' ecological policies. Based on our analysis, we have determined and justified the following priority areas for greening and sustainable development and measures for their implementation for four groups of the countries:

- for Sweden, Japan, Denmark, the Republic of Korea, the UK, France, Germany, Ireland, Spain, the Czech Republic, and Mexico, where it is necessary to improve environmental aspects of the quality of life, these priorities should include financing to maintain the environmental status, introducing eco-innovation and developing new eco-innovations by increasing the productivity and efficiency of natural resource use, and raising funding for environmental research and eco-innovation;
- for Italy, whose main goal is to reduce the carbon intensity of the economy and enhance its resource efficiency by increasing environmental friendliness and resource productivity, the priority areas for greening should include maintaining the current environmental status with resource-saving technologies by introducing ecosystem and biodiversity restoration technologies, introducing innovations, and using "green" technologies;
- for Hungary and the USA, to increase economic opportunities by selecting measures aimed at the long-term use and restoration of natural resources, the priorities for greening should include financing environmental improvements, introducing eco-innovations with ecosystem and biodiversity conservation technologies, and raising revenues with adequate pollution charges;
- for Ukraine, which aims to conserve natural resources, the priority areas for greening should include introducing ecosystem restoration technologies and administrative tools for environmental conservation through regular environmental monitoring, ensuring financial consolidation by reviewing the composition and efficiency of public expenditure and raising revenues with adequate pollution charges, ensuring balanced macroeconomic conditions and stable resource prices, and reducing environmental impact and mitigating natural hazards/risk management.

Based on an index method, the research allowed us to improve the hierarchical structure of the strategic goals system of the global economic space greening process. A matrix of priority directions of the greening process was then developed and practical recommendations on their implementation for different groups of countries were provided, identified after analyzing the environmental development index and GDP growth rate.

Thus, to develop a national environmentally friendly nature manage policy that ensures sustainable economic development at the national level, countries must identify

the priority directions for sustainable development greening and find practical measures to implement them.

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Priorytety ekologizacji i zrównoważonego rozwoju krajów członkowskich OECD i Ukrainy: analiza porównawcza

Artykuł koncentruje się na określeniu priorytetowych obszarów ekologizacji i zrównoważonego rozwoju dla krajów OECD i Ukrainy, mających na celu osiągnięcie ogólnego postępu w interakcji między gospodarką a środowiskiem, a także stworzenie koniecznych warunków wstępnych do wspierania innowacji i inwestycji w celu znalezienia nowych źródeł wzrostu gospodarczego, zgodnych z ekosystemami wykazującymi zdolność regeneracji. Udowodniono, że chociaż globalne cele gospodarki ekologicznej są istotne dla wszystkich krajów świata, muszą być dostosowane do specyfiki regionalnej i krajowej, a także do poziomu rozwoju gospodarczego każdego kraju.
W badaniu wykorzystano ogólne jakościowe i ilościowe metody badań ekonomicznych, w tym analizę systematyczną, porównawczą, metody analizy logicznej i statystycznej, metodę wskaźnikową i inne. Zastosowane podejście teoretyczne i metodologiczne pozwoliło zidentyfikować ogólne trendy rozwoju czynników środowiskowych w krajach OECD i na Ukrainie oraz ich wpływ na wzrost gospodarczy. W badaniu przeanalizowano w szczególności obecny stan i perspektywy ekologizacji i zrównoważonego rozwoju w krajach OECD i na Ukrainie w oparciu o wyniki kompleksowej oceny poziomu ekologizacji tych gospodarek oraz relacji między wewnętrznym środowiskiem ekologicznym – ocenianym za pomocą wskaźników „zielonego wzrostu" – a ich rozwojem gospodarczym. Artykuł uzasadnia również wprowadzenie priorytetów w zakresie ekologizacji i zrównoważonego rozwoju, a także sugeruje praktyczne środki ich realizacji. Mogą one służyć jako podstawa do opracowania polityki skutecznego zarządzania środowiskiem i opracowania krajowego systemu zarządzania i administracji przyjaznego środowisku.

Słowa kluczowe: globalne problemy środowiskowe, globalna strategia środowiskowa, zielony wzrost, ekologizacja, priorytety ekologizacji i zrównoważonego rozwoju

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Ukrainian Migration Aspirations towards Germany: Analysis and Development Scenarios

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Abstract

Based on the multiple regression model and scenario approach to forecasting, the article estimates the Ukrainian migration aspirations towards Germany (the scale of migration, the economic activity of migrants, and their economic benefits). It is argued that major transformations in the gender-age structure of the German population may cause a demographic crisis and labour market imbalances. Our projections indicate the growing role of foreign human resources in the German economy. When modelling the scale of emigration from Ukraine, an integrated approach is applied, considering not only trends of pull-push factors but also special aspects of the German

migration policy and the outflow of 8–10 million Ukrainian migrant workers. Given the poor statistical data on the scale of labour emigration needed for constructing reliable econometric models, the use of expert forecasting method remains the most optimal technique for assessing potential migration flows and migration systems.

Keywords: migration aspirations, socio-economic factors, forecast, migration policy, Ukraine, Germany

JEL: F22, J11, O15

Introduction

Individual characteristics such as age, gender, education, religion, marital status and personal attitudes towards migration have a significant impact on making the final decision to migrate. These are the micro-level factors, which along with the macro drivers (social, economic, political and ecological factors) determine migration processes, especially the potential scale of international migration. In this context, forecasts of migration aspirations, the socio-economic conditions, and the prospects for their future change play an important role in developing effective migration policies.

Transformation processes in the Ukrainian economy, burdened by the global financial and economic crisis, have intensified migration flows and resulted in growing migration aspirations of the population towards the countries of the EU area (e.g., Poland, Germany, the Czech Republic, and Italy). International migration partially compensates for ageing and population decline, meets labour demand for low-paying jobs and jobs with poor working conditions, increases private emigrants' transfers to donor countries, and reduces the budgetary burden in the social sphere (savings of pension and social benefits). However, excessive migration aspirations exert additional pressure on state budgets, deform the age structure of the population, create labour shortages, reduce a country's intellectual potential, and decrease budget revenues because of a fall in the number of potential taxpayers.

In this regard, the development of a system of estimates and forecasts of population migration, aimed at solving the problems outlined above, is relevant due to the formation of new migration systems and networks. Such a system is crucially important for Ukraine, which is one of the largest migrant donor countries for the EU, USA, and Canada. In these recipient countries, the immigrant population is becoming more significant, given a decreasing impact of natural changes on population dynamics, which is a particular challenge for Germany, Italy and Poland, already experiencing zero or negative natural population growth ("Kurier" 2018).

Literature review

International migration is a complicated phenomenon that is difficult to tackle and measure. Forecasting such processes is challenging, characterised by a high error rate, the highest among the three demographic parameters (fertility, mortality and migration). Therefore, many modern methods of forecasting future trends and characteristics of population migration require improvement to better address the emerging challenges in the socio-demographic sphere. Considering most of the existing influencing factors, Libanova (2009; 2010) thoroughly studied social and economic characteristics of external labour migration in Ukraine, paying particular attention to the directions of labour emigration, the living and working conditions of the Ukrainian nationals abroad, labour migrants' earnings and remittances, and the impact of labour migration on the development of the labour market in Ukraine.

Experts from the Ptoukha Institute for Demography and Social Studies of the National Academy of Sciences of Ukraine (Poznyak and Shevchuk 2014; Sarioglo 2016), working on issues related to migration forecasting, discovered the influence of socio-economic factors on the formation of migration systems. Meanwhile, analytical assessments of labour and educational migration, the development of a conceptual framework for migration policy, as well as the inclusion of diaspora issues into the research methodology at the National Institute for Strategic Studies of Ukraine are presented in various scientific publications by Malynovska (2013; 2015a; 2015b).

With the escalation of the military conflict in the east of Ukraine, the problem of an increasing number of internally displaced persons arose, along with their social protection and the development of appropriate state policy. In addition, other important issues relating to internal migration flows, potential migrants to EU countries, their motivational attitudes, as well as the mechanisms for regulating internal and external migration have been fully considered by the experts from the Dolishniy Institute of Regional Research of the National Academy of Sciences of Ukraine (Bil 2017; Sadova et al. 2019).

Significant environment fluctuations in the national labour market, foreign policy uncertainty, and the continuously unstable economic situation in the country have not helped the development of the long-term forecasting concept. Therefore, the short-term forecasting of regional migration is most common among Ukrainian scientists (Ovchynnikova 2017).

Migration processes in Eastern Europe and Central Asia draw the attention of many researchers and policymakers since these processes have been conditioned by political (the collapse of the Soviet system in 1990, the emergence of conflicts and new states, the opening of European borders) and economic factors (the decline in the living standards, low wages, minimum social security, etc.). As outlined by Mansoor and Quillin (2006), in the countries of the former Soviet Union, multiple waves of migration started to get out of the authorities' control, forming new migration vectors and systems. Mahmoud, Trebesch and Trebesch (2010) analysed labour migration based on the microdata from unique household surveys conducted in Belarus, Bulgaria, Mol-

dova, Romania and Ukraine. According to their research, the undercount of migration makes it impossible to predict a country's economic development and to create conditions for balancing a national labour market, but it does not contribute to effective migration policymaking.

In terms of globalisation, the role of migrant remittances and re-emigration as the main factors that affect the development of migration donor countries is particularly important. For instance, Wickramasekara (2008) studied globalisation and its implications for international labour migration and the protection of employee rights.

It should be stressed that there is no reliable data on international migration in many countries of the world. Thus, Hyndman and Booth (2008) estimated net migration as the difference between historical data on an annual population and successive populations one year ahead from the forecast using data on fertility and mortality. They obtained specific population projections by age and gender based on modelling (the Monte Carlo method) future fertility, mortality and net migration, which were combined in a cohort-component method.

Keilman and Pham (2004) paid significant attention to the forecast of three major demographic variables (fertility, mortality and migration), analysing the empirical errors that have been observed in the forecasting methodology of 14 European countries since 1950. Bijak (2006) also explored methodological issues and regarded socio-economic forecasts as those that can be based either on general patterns and theories or on special models developed with consideration of migration theories. His models are widely used for modern migration forecasts.

Based on the above arguments, we defined two hypotheses of the research:

Hypothesis 1: The formation of the Ukraine-Germany migration vector takes place under a long-lasting and mostly one-sided influence of socio-economic factors that transformed the migration behaviour of Ukrainian emigrants.

Hypothesis 2: The demographic situation and labour market conditions in Germany vary depending on migration flows from the countries that are the primary donors of the labour force (including Ukraine).

The main objective of the research is to analyse and model the Ukraine-Germany migration vector. Accordingly, the article consists of five sections, containing research methodology, the results of analysing and modelling the Ukraine-Germany population migration vector, conclusions and the authors' proposals.

Methodology

The algorithm for predicting Ukrainian migration to Germany is complicated by the demographic trends of the two countries, their economic growth trends, and changes in the labour market conditions.

To confirm the first hypothesis, a multiple linear equation of direct dependence (variation) (1) was composed, allowing us to calculate the partial effect of each factor

on the dependent variable (the intensity of Ukrainians' immigration to Germany). The dependence of the immigration intensity coefficient, which is expressed as the number of Ukrainians who went to Germany per 1,000 local German population. The dependence of the coefficient on selected socio-economic factors is determined using the Least Squares method with instrumental variables (NLS), which considers the possibility of mutual causality between dependent variables.

$$COEF_t = \alpha_0 + \alpha_1 INF_t^{UA} + \alpha_2 EF_t^{EC} - \alpha_3 SAL_t^{GERM} - \\ -\alpha_4 SAL_t^{UA} - \alpha_5 UNEMP_t^{GERM} \quad (1)$$

where $COEF_t$ is the coefficient of the intensity of Ukrainians' migration to Germany (index, current year vs previous one); INF_t^{UA} is the inflation rate in Ukraine; EF_t^{EC} is the economic benefits of Ukrainians which they achieve in the labour market in Germany (index, current year vs previous one); SAL_t^{GERM} is the average wage in Germany, SAL_t^{UA} is the average wage in Ukraine (index, current year vs previous one); $UNEMP_t^{GERM}$ is Germany's unemployment rate.

Annual data provided by the Statistical Offices of Ukraine and Germany for 2006–2017 are used. The personal economic benefits of Ukrainian labour migrants in Germany are calculated as the difference between the wages (and other types of income) received by employed Ukrainian migrants in Germany, and those of the potential income earned by Ukrainians had they remained participants of the labour market in Ukraine.

The results of model (1) are presented in Table 1. All the factors' values and the dependent variable are reduced to homogeneous series (standardised data), which makes it possible to obtain high validity estimates of the model using the coefficients of determination, the adjusted coefficient of determination, and the coefficient of the Durbin-Watson statistic (Table 3).

Table 1. Validity coefficients for the model variables

Variable	Estimated coefficient	Standard error	t-statistic	p-value
INF^{UA}	0.3492	0.1870	1.8668	0.1112
EF^{EC}	0.8248	0.5769	1.4297	0.2028
SAL^{GERM}	–0.2842	0.1990	–1.4286	0.2030
SAL^{UA}	–0.5750	0.7538	–0.7628	0.4745
$UNEMP^{GERM}$	–0.6988	0.4060	–1.7211	0.1360

Source: authors' calculations.

To confirm the second hypothesis, the size of the Ukrainian community in Germany was predicted based on a scenario approach, namely on modelling the reference, optimistic, tendentious and pessimistic patterns. This approach implies considering the modelled socio-economic factors (1) that influence migrants' aspirations within the Ukraine-Germany migration vector.

Results and discussion

Analysis of the Ukraine–Germany migration vector

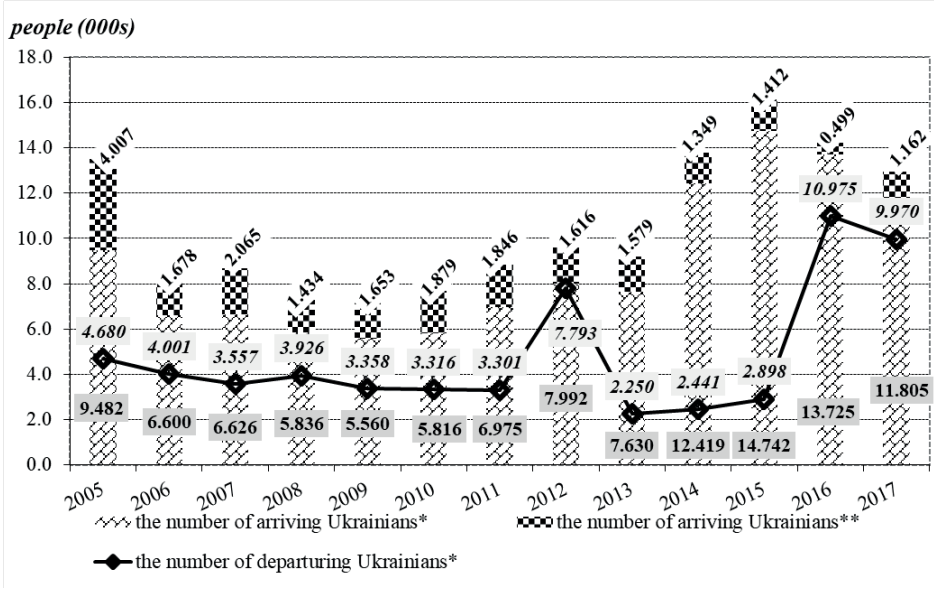
According to the results of the International Organization for Migration research (Sadova et al. 2019), Germany is the second most popular emigration destination for Ukrainians (after Poland) in the list of the most attractive countries to work in. At the same time, the main pull-factor for migrants from Ukraine is the relatively high values of wage rates in recipient countries. Between 2006 and 2017, the average salary of Ukrainians living in Germany was five times higher than the Ukrainian national indicators.

Concerning the number of Ukrainian labour migrants, the situation is not clear. Domestic statistical institutions do not keep complete records of the data necessary to conduct a detailed analysis and draw comprehensive conclusions. The available information is also called into question since there are significant differences in the quantitative estimates of migration intensity and flows of migrants. According to the State Statistics Service of Ukraine, approximately 22,000 people emigrated from Ukraine to Germany between 2005 and 2017 (State Statistics Service of Ukraine n.d.), while according to the German statistical service, it was 115,000 people (Ausländische Bevölkerung n.d.). The undercount of migrants in the Ukrainian data amounts to 5–10,000 people every year. We should mention that the gap in statistical data of the two countries reached a maximum of 13,000 people in 2016 (Figure 1).

The analysis shows that the number of Ukrainians legally staying in Germany is growing, and in 2017, it was equal to 138,000 people. However, according to the State Migration Service of Ukraine, the number of Ukrainian nationals who were on the consular register in Germany between 2014 and 2017, varied between 105,000 and 113,000 people (State Migration Service of Ukraine 2017), which is 20–25% less than Germany's official statistics. Such a difference in estimates indicates the reluctance of Ukrainians to register their official residence, as well as their distrust of the representative bodies of Ukraine in Germany.

Between 2004 and 2013, based on official German statistics, the number of Ukrainians who arrived in Germany exceeded the number of departures. Between 2005 and 2017, 115,000 arrived, while almost 63,000 thousand emigrated. The number of Ukrainians has decreased mostly due to their acquisition of German citizenship rather than outflows of migrants. Thus, according to official data for the period 1998–2017, about 3,500 Ukrainian migrants per year changed their Ukrainian citizenship for German (Einbürgerungen (n.d.) – year 2017).

There are many cases when the departure of Ukrainian citizens for permanent residence is carried out without an official appeal to the authorities. Therefore, Ukrainian emigrants who have obtained foreign citizenship without undergoing the relevant procedures in Ukraine are still considered Ukrainian nationals (State Migration Service of Ukraine 2017).



*according to data of the Federal Statistical Office of Germany (n.d.)

**according to data of the State Statistics Service of Ukraine (n.d.)

Figure 1. Number of arrivals and departures of Ukrainian nationals in Germany, 2005–2017
Source: authors' own compilation based on data from the State Migration Service of Ukraine, Migration Profile of Ukraine (n.d.) – years: 2005, 2007, 2010, 2012, 2014, 2017; Einbürgerungen (n.d.) – years: 2005, 2007, 2010, 2012, 2014, 2017.

In general, the number of Ukrainians and Germans with Ukrainian ethnic origin varied between 230,000 in 2006 and 319,000 in 2017 (Figure 2).

Analysis of the Ukrainian migration data (Figure 3) showed that in 2017, about 60% of the women and 50% of the men living in Germany were economically active and aged 25–54 years old. There are minor differences in the age structure of migrants: the median age of women is lower than that of men, and the proportion of children under 14 was 12% of boys and 5% of girls.

An important part of the study of the Ukraine-Germany migration vector is identifying the reasons for migration. The complexity of such analysis lies in the fact that the German migration legislation has been changed multiple times in recent years, and classification of the purposes for the foreign citizens' arrival in the Federal Republic of Germany has often been amended and clarified. Therefore, such indicators are not comparative in dynamics. The structural analysis of emigration purposes of Ukrainians to Germany as of the end of 2017 is shown in Figure 4.

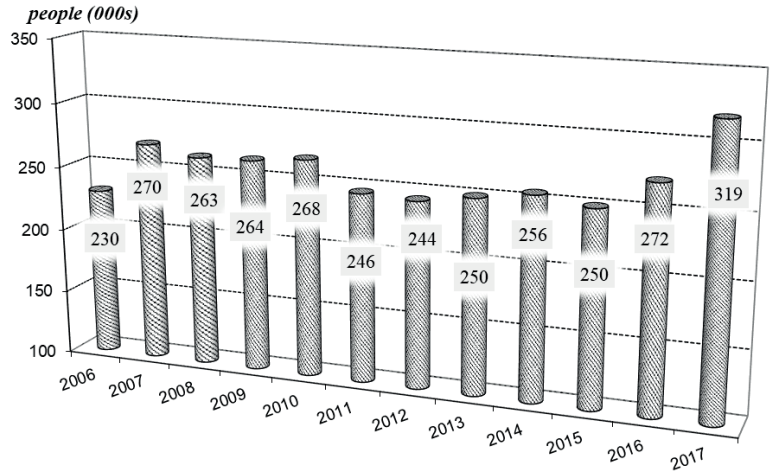


Figure 2. Number of ethnic Ukrainians in Germany, 2006–2017
Source: authors' own compilation based on data from Ausländische Bevölkerung (n.d.) – years: 2006, 2008, 2009, 2011, 2014, 2016, 2017.

The main purpose for the emigration of about 50% of Ukrainians is family reasons, and for 20% – education or work. According to the German Academic Exchange Service, in general, Ukrainian students in Germany ranked sixth among all foreign students. About 9,000 young people from Ukraine study and conduct research in German universities. Some of them are members of the Union of Ukrainian Students in Germany. Before the intensification of educational migration from Ukraine to Poland, Germany was the leader among other countries (except for Russia) in the number of Ukrainian students.

It is necessary to consider the territorial aspect of migration processes when evaluating the Ukraine–Germany migration vector. Intensive territorial mobility causes changes not only in the gender and age distribution of the population but also in the settlement structure of the country, creating pull-push centres of human resources. Such centres form the framework of migration systems, including the Ukrainian–German one.

As of the beginning of 2018, the largest number of Ukrainians lived in the southern and eastern states of Germany, namely in Berlin (309 per 100,000 people), Hamburg (215 per 100,000 people), Bremen (206 per 100,000 people), Mecklenburg-Vorpommern (246 per 100,000 people) and Bavaria (211 per 100,000 people). The results of the territorial distribution of migrants confirm the existence of a strong direct correlation between the employment rate of the population and the number of Ukrainians, as suggested by the federal states of Germany.

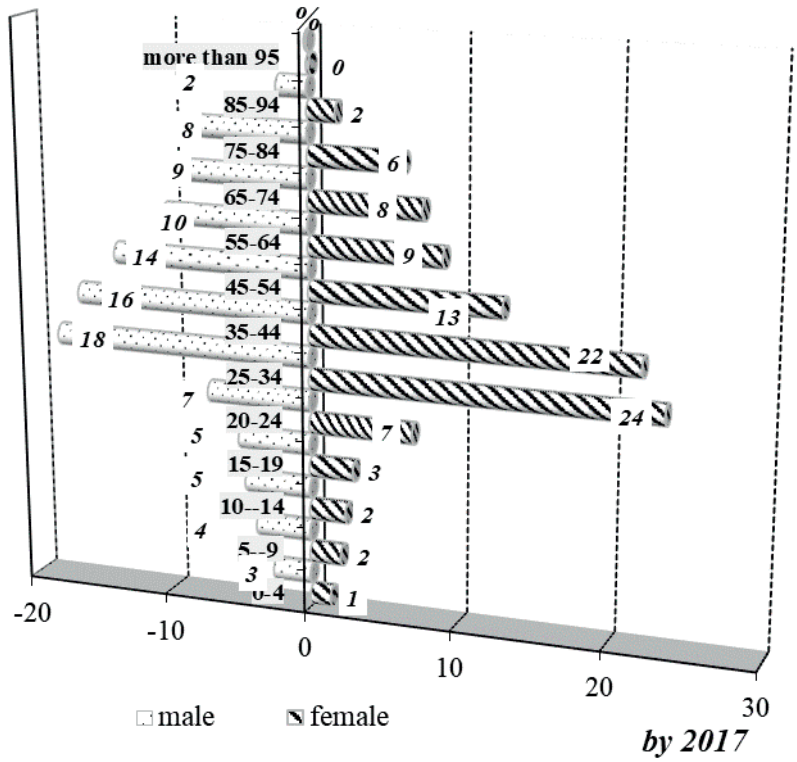


Figure 3. Gender and age structure of Ukrainians living in Germany, 2017
Source: authors' own compilation based on data from Ausländische Bevölkerung (n.d.) – year: 2017.

The Ukraine–Germany migration flow has a steady and integral character as opposed to the Germany–Ukraine migration flow, which is non-systemic and insignificant in size. According to the All-Ukrainian Census of 2001, about 33,000 Germans lived in Ukraine as of that time. The average density was 69 people per 100,000 population (All-Ukrainian Population Census 2001). In territorial terms, two areas of a denser residence of Germans in Ukraine can be distinguished: the west and south-east. Thus, the Zakarpattia region had the highest concentration of Germans – 284 per 100,000 population, and in the south-eastern part of Ukraine (Dnipropetrovsk, Kherson, Zaporizhzhya, Odesa regions and the Autonomous Republic of Crimea) – about 110 per 100,000 population. According to the State Statistics Service of Ukraine, in 2010–2017 more than 3,000 people moved from Germany to Ukraine for permanent residence, of which about 40% were Ukrainians and 1,600 were citizens of the European countries, including Germany (State Statistics Service of Ukraine 2018).

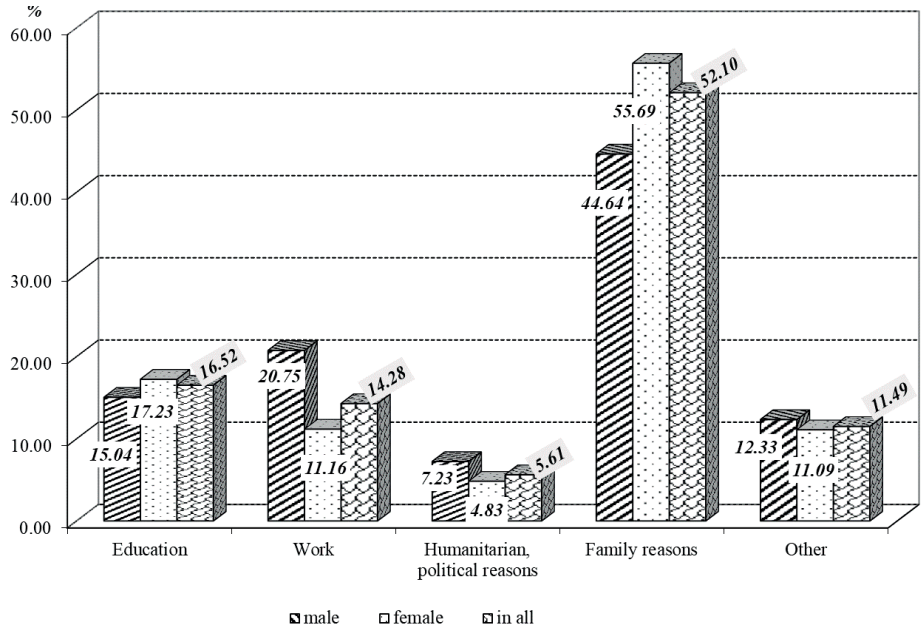


Figure 4. Reasons for Ukrainians' emigration to Germany, as of 1.01.2018
Source: authors' own compilation based on data from Ausländische Bevölkerung (n.d.) – year: 2018.

Modelling the Ukraine–Germany migration vector

A significant deformation of the age structure of an indigenous population is the result of a nation's hyper-ageing. It is of note that "indigenous population" as a term refers to citizenship or living in a country for a certain period, or the fact that previous generations of relatives live in the country. In this regard, fundamental changes in the age structure of the population can lead to demographic collapse, which makes a country's economic growth impossible due to workforce shortages in the national labour market. Such trends greatly contribute to increasing the state budget expenditures on financing the pension fund and other social protection structures.

These arguments confirm the initial statement regarding the dependence of the German economy on human migration flows from other states. Their intensity must increase from year to year in order to minimize the consequences of the demographic crisis and avoid a significant imbalance in the labour market. As evidenced by the data in Table 2, positive annual net migration of about 300,000 people is sufficient to maintain a stable demographic situation in Germany by 2030. However, according to the forecast for the period 2030–2060, annual net migration should increase to 0.5 million people to offset natural population losses in the country.

Retrospective analysis of the local population size and structure showed that the population in Germany remained almost constant throughout the period analysed.

The high proportion of immigrants caused this situation, and the trend is expected to continue for another 10–20 years. It should also be mentioned that during this period, the difference between the actual data and the reference data will be balanced by the large scale of migration. In this case, in 2030, about 16 million migrants may live in the Federal Republic of Germany, which amounts to 20% of the indigenous population. In 2050, one in three residents in Germany and almost every second resident in 2060 will have migrant status or an immigrant background.

Table 2. German population forecast including migration by 2060

Actual values, millions of people									Growth rate
2000	2005		2010			2015			2015/2000
82.26	82.44		81.75			82.18			0.998
Projected values, millions of people									**Growth rate**
2020	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**2055**	**2060**	**2060/2015**
m=0									
80.65	77.45	75.50	73.34	71.00	68.47	65.74	62.94	60.23	0.733
0<m<100									
81.44	80.51	79.23	77.70	75.96	74.03	71.90	69.70	67.57	0.822
100<m<200									
81.82	81.32	80.61	79.73	78.66	77.42	76.08	74.76	74.78	0.910
200<m<300									
83.01	82.85	82.26	81.53	80.27	79.45	78.56	77.76	77.74	0.946

m – scope of migration in millions of people
Source: authors' calculations.

Ukraine's demographic prospects for natural reproduction depend on specific modern trends, e.g., the large-scale internal (with the prospect of becoming external) and external migration in Ukraine as a result of the military conflict in Donbas, the consequences of increasing poverty, which is provoking emigration and thus a reduction in population, as well as Ukraine being the European leader in AIDS, tuberculosis, measles and other infectious diseases. Such a scenario is confirmed by the results of research conducted by scientists of the Ptoukha Institute for Demography and Social Studies of the National Academy of Sciences of Ukraine (Poznyak and Shevchuk 2014). According to estimates, the most likely scenario is a decline in Ukraine's population, from 42.4 million people in 2017 to 37.1 million at the beginning of 2060. The lower limit of the population size is projected at around 28.3 million people. If, during the period covered by the forecast, the natural and migratory movement trends persist, the number of Ukrainians will reach 32.4 million at the beginning of 2060, which is 10 million less than in 2017.

Considering the age structure of the population in the medium and long-term, a decrease in the share of people of active working age is expected in Ukraine. At the same time, according to some variants of the forecast, the indicator may fluctuate between

47.7% and 55.3% at the beginning of 2060. If the trend of the ageing and worsening of the population age structure in Ukraine persists, it will further lead to a shortage of labour resources in the domestic labour market.

According to calculations, the long-term unilateral impact of socio-economic factors stimulated the development of, specifically, the Ukraine-Germany migration vector, and not vice versa. It should be noted that model (2) shows how any changes in the factor values can lead to a transformation in Ukrainian emigrants' behaviour. The results of the mathematical economic model estimation are presented in Table 3. In particular, about 88% of the change in the growth rate of the coefficient of the intensity of Ukrainian emigration to Germany for the period 2006–2017 is caused by the factors included in the model (the coefficient of determination is 0.876). There is a strong correlation between the rate of Ukrainians' emigrating to Germany and socio-economic factors, as evidenced by the multiple correlation coefficient, which is equal to 0.91.

$$COEF = 1.091 + 0.349INF^{UA} + 0.825EF^{EC} - 0.284SAL^{GERM} - \\ -0.575SAL^{UA} - 0.698UNEMP^{GERM} \\ adj.R^2 = 0.876 \\ DW = 1.59 \quad (2)$$

To determine the level of importance and influence of each factor on the dependent variable variation, the coefficients of elasticity were calculated, which showed that with a 1% increase in inflation rates in Ukraine (INF^{UA}) and with constant values of other factors, a 1.08% increase in the intensity of Ukrainians' migration to Germany is expected. A 1% increase in the average wage in Ukraine (SAL^{UA}) and unemployment in Germany ($UNEMP^{GERM}$) leads to a 2.01% and 2.2% migration decline, respectively. In general, the model estimation results revealed that with a 1% increase in the variable values presented in the model, the dependent variable (COEF) would decrease by 3.13%.

Table 3. Model estimation results

Criteria	Values	Criteria	Values
Coefficient of determination (R-squared)	0.875670	Standard error of dependent variable	1.000000
Adjusted R-squared	0.772062	p-value	0.010893
Standard error of regression	0.477428	Akaike info criterion	1.666047
Sum squared resid	1.367626	Schwartz criterion	1.908500
Log likelihood	–3.996282	Hannan-Quinn criterion	1.576282
F-statistic	8.451759	Durbin-Watson statistic	1.592582

Source: authors' calculations.

The values of partial correlation coefficients, as well as coefficients of elasticity, confirm the hypothesis that the system of socio-economic factors is driving the process of developing the Ukraine–Germany migration vector.

In case of economic growth in Ukraine and constant economic progress in Germany, provided for by the reference scenario, the number of Ukrainians, who move annually to Germany, will remain at the level of 10–12,000 people per year until 2025 with a sharp decline in 2030 (to 1,500 people). Thus, the ethnic Ukrainian community will grow to 380,000 people by 2025 (Table 4).

Table 4. Forecast of the number of ethnic Ukrainians in Germany by 2030: a scenario approach

Forecast data, people (000s)	2020	2023	2026	2029	2030	2030/2017
Reference	343	366	381	381	378	1.19
Optimistic	332	332	324	313	309	0.97
Tendentious	347	379	414	438	445	1.39
Pessimistic	363	448	585	750	811	2.54
Crisis	378	515	789	1210	1392	4.36

The number of ethnic Ukrainians in Germany in 2017 was 319,000 people.
Source: authors' calculations.

According to this scenario, the change in the trend is associated with the equalisation of values of the main indicators that act as a booster to migration activity, namely wages, unemployment and inflation. In 2030, with an average wage of 3000 EUR per year (authors' estimation according to the reference scenario), both in Ukraine and Germany, the personal economic benefit from migration will be too low – approximately 33 million EUR per year (Table 5). Under such conditions, the number of potential emigrants from Ukraine could be significantly reduced, and systematic labour migration could evolve into educational or tourist-family migration. As a result, the new migratory movements of Ukrainians will appear to be more stochastic than deliberate and regular.

In addition to the economic factors, the decrease in mobility of the citizens of Ukraine in the period 2025–2030 in the reference forecasting scenario can be explained by particular features of the main characteristics of Ukraine's population. The acute demographic crisis and, consequently, the labour force crisis are caused by the migration of human resources in the young and middle age, combined with low birth rates during the beginning of the 21st century. Therefore, preserving the number and optimizing the age structure of the population of Ukraine, as important characteristics of the national economic security, are pressing issues today. Ukraine's potential economic success will be impossible to realise without a skilled labour force in the future. Upon achieving sustainable economic growth, the demand for personnel will increase exponentially. To enhance people's well-being, labour market mobilisation using not only internal resources but also external ones is required. It should also be noted that the economic revival of Ukraine is the basis for its transforming from a donor labour country to a recipient country. At the same time, one should not expect an increase in the intensity of migration flows from Germany to Ukraine.

Table 5. Forecast of personal economic benefits of employed ethnic Ukrainians in Germany: a scenario approach, *million EUR per year*

Actual data				Forecast data/development scenarios					
2006	2010	2014	2017	2020	2023	2026	2029	2030	2030/2017
52.9	97.2	94.2	181.4	Reference					
				350	284	182	61	33	0.18
				Optimistic					
				189	64	17	3	1	0.005
				Tendentious					
				391	353	297	203	182	1.003
				Pessimistic					
				605	830	1027	1026	1029	5.67
				Crisis					
				831	1265	1843	2249	2420	13.34

Source: authors' calculations.

The results of the optimistic forecast scenario of Ukrainians' migration to Germany demonstrate the improvement in the economic situation in Ukraine, in contrast to Germany, where economic deterioration is predicted. Unemployment growth in Germany against a possible economic miracle in Ukraine could create conditions to effectively regulate the population's migration activity in terms of tourism, rather than labour activity, even before 2025.

According to the results of the analysis carried out by the method of system dynamics, the probability of rapid rates of economic growth in Ukraine and minimising economic losses due to labour migration is very low. The difficult military and political situation, the two economic crises of the 21st century, accompanied by a significant devaluation of the national currency, hyper-growth of prices, high unemployment and corruption scandals nullified the economic breakthroughs in Ukraine. Consequently, actual and potential labour migration is growing, as well as a lack of belief of many young Ukrainians in the possibility of improving their wealth and personal development in the country. The reference and optimistic forecasts allow us to determine parity scenarios according to which the states can develop to achieve the economic and demographic balance (Mulska and Baranyak 2019).

The presented tendentious forecast scenario shows a moderate growth of economic and social standards in Ukraine, which is the most acceptable scenario for Ukraine. In absolute terms, the intensity of the Ukraine–Germany migration flows will increase to 400,000 people in 2025 and 450,000 people in 2030. Between 2019 and 2027, the average annual number of new immigrants from Ukraine will fluctuate between 13,000 and 15,000 people, gradually decreasing to 10,000 people in 2030.

According to the medium and long-term forecasts, the number of employed ethnic Ukrainians will remain at the level of approximately 200,000 people (Table 6). The income gap of citizens will increase by 1.003%, from 181.4 million EUR per year

in 2017 to 182 million EUR per year in 2030 (based on the authors' tendentious forecast data).

Table 6. Forecast of the number of employed ethnic Ukrainians in Germany by 2030: a scenario approach

Actual data, people (000s)				Forecast data, thousand people/development scenarios					
2006	2010	2014	2017	2020	2023	2026	2029	2030	2030/2017
63	97	109	144	Reference					
				165.3	181.1	185.3	174.8	169.9	1.18
				Optimistic					
				153.3	150.0	137.7	123.7	119.1	0.83
				Tendentious					
				166.9	187.9	201.4	201.3	199.7	1.39
				Pessimistic					
				174.9	221.9	284.0	344.5	364.2	2.53
				Crisis					
				182.0	255.0	383.5	556.0	625.3	4.34

Source: authors' calculations.

Under a pessimistic scenario of the development of Ukraine's economy, which reflects an increase in the average wage by 10% per year and a simultaneous rise in prices by 20%, the deformation of the Ukraine–Germany migration vector will only intensify. The growing poverty among Ukrainians might cause a significant scaling-up of the flows of migrants through the Ukraine–Germany migration channel. With such constant values of factors, the number of arrivals from Ukraine will steadily grow, and the number of ethnic Ukrainians officially living in Germany will increase threefold (to more than 800,000 people) by 2030.

A large gap in the incomes of citizens of Ukraine and other EU countries is a major factor in the migrants' choice of a potential migration system, country of employment or permanent residence. This is reflected in the nine times growth of personal economic benefits (from 181.4 million EUR in 2017 to 881.8 million EUR in 2030) and in an increase in the number of employed ethnic Ukrainians in Germany (from 144,000 to 364,000 people between 2017 and 2030).

Conclusions

Future capacities in forecasting migration processes require not only new and more innovative methods and predictive models, but also a new philosophy in understanding actual forecasts and their significance for government regulation of migration activity. The methods and tools should be based on reasonable forecasts in line with the development of major migration systems.

Given the demographic situation in Ukraine and the results of forecasting the Ukraine-Germany migration vector, the strategic guidelines of state policy should be as follows:

1. Ensure the proper level of controllability of the Ukraine-Germany migration trends in the short, medium and strategic perspectives.
2. Form a system of factors and motivations for return migration to Ukraine and retain its human resources.
3. Activate mutually beneficial migration exchanges in terms of employment, tourism, education, science, research and innovation activities, investment and business projects.
4. Develop common positive practices and experience in effective state regulation of migration processes, the convergence of the institutional system of migration regulation with advanced models in the EU, and counteract modern migration challenges and threats to Ukraine.

The primary tools to implement the state migration policy in the framework of the Ukrainian-German migration system should be:

1. Monitoring the quantitative and structural characteristics of migration by the leading (according to scales and trends) countries (regions) to create a relevant qualitative and comprehensive information and analytical basis to develop effective management decisions. This requires assigning respective tasks and expanding the authorities of the regional offices of the State Migration Service of Ukraine (in cooperation with the territorial bodies of the State Border Service of Ukraine).
2. In terms of the current Strategy of the State Migration Policy of Ukraine for the period up to 2025 (No. 482-p dated February 7, 2017), developing (by the Ministry of Social Policy of Ukraine), adopting and implementing the Program of measures aimed at regulating the Ukrainian-German migration processes, dividing tasks into current, medium-term and strategic ones (in accordance with the demographic and migration forecasts defined in the research).
3. Introducing new institutional tools to stimulate return migration (especially educational and labour migration) to Ukraine. Realising the objectives and activities of this tool provides for the harmonisation of provisions and the conclusion of interstate agreements in the areas of education, training, employment and migration, to "embed" effective factors that motivate people to return. The latter is related to:
   – guarantees of preserving jobs and places in educational institutions; projects of interregional cooperation in the framework of educational and labour exchange and mobility;
   – tax and fiscal holidays as well as financial and economic incentives for investing;
   – organisational and other support in creating new types of business in Ukraine;
   – legalising intermediaries' activities in the market of migration services by creating high-quality, transparent infrastructure of the Ukrainian–German migration system.

4. Strengthening internal factors to deter external labour migration from Ukraine and encouraging gradual migration of German specialists to Ukraine. This requires intensifying relevant efforts, and coordinating the activities of Ukrainian and German departments and divisions of the Ministry of Social Policy, the State Labour Service, employers' organisations, business associations, domestic and international organisations on labour, employment and migration, as well as leading corporations.

   As part of this tool, the further development and setting up new German-invested enterprises in Ukraine could become an effective institutional platform that helps create new jobs and decent working conditions, attract advanced western technologies, increase exports and imports, and drive up real wages as a source of income for the population and as an important incentive to work. Today, more than 4000 enterprises with German capital are officially registered in Ukraine (e.g., Kromberg & Schubert, Bader-Ukraine, Forschner Ukraine, Leoni-Ukraine, Kostal Ukraine, HeidelbergCement, KNAUF Gypsum Donbass, Klingspor-Ukraine, Henkel Bautechnik Ukraine in the automotive component industry and in construction; Pfeifer & Langen Ukraine, Toepfer International Company (Alfred C. Toepfer International GmbH) in the agricultural sector; and Metro Cash & Carry in trade).
5. Integrating re-emigrants and immigrants from Germany into Ukrainian society. The process of integrating and adapting migrants implies providing assistance in finding an acceptable job, introducing a state system of affordable lending, offering tax breaks for migrants who wish to start their own business in Ukraine, and also negotiating with the German government to develop and implement programs for the voluntary return of migrants and to reintegrate them in their country of origin jointly with Ukraine on a shared funding basis.

Creating a special central authority to develop and implement state migration policy (according to the practice of the states with highly effective migration policies – the Ministry of external migration relations) is becoming increasingly urgent for Ukraine. Its main functions will include expanding legal channels of the Ukrainian citizens' employment in the recipient countries, protecting the rights of Ukrainian labour migrants, and concluding interstate agreements on social security and pension provision for migrant workers.

Implementing these tools will make it possible to transform the environment that affects the Ukraine–Germany migration vector into a more predictable and manageable one, able to advance the social, humanitarian and economic interests of Ukraine, Germany and their citizens (actual and potential migrants). It will also create new effective incentives to revive immigration, including attracting qualified German specialists, and it will serve as additional pull-factors of labour migration in Ukraine to reduce imbalances in the national labour market and increase social guarantees and living standards.

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Vitalii Boiko, Olha Mulska, Ihor Baranyak, Olha Levytska

Aspiracje migracyjne Ukraińców do Niemiec: analiza i scenariusze rozwoju

Na podstawie modelu regresji wielokrotnej i podejścia scenariuszowego do prognoz oszacowano ukraińskie aspiracje migracyjne do Niemiec (skala migracji, aktywność gospodarcza migrantów i ich korzyści ekonomiczne). Argumentuje się, że poważne zmiany w strukturze wiekowej i płci ludności lokalnej mogą powodować kryzys demograficzny i utratę równowagi na rynku pracy. Przedstawione prognozy wskazują na rosnącą rolę zagranicznych zasobów ludzkich w niemieckiej gospodarce. Modelując skalę emigracji z Ukrainy zastosowano podejście zintegrowane, uwzględniające nie tylko trendy czynników przyciągających, ale także szczególne aspekty niemieckiej polityki migracyjnej i odpływ 8–10 milionów ukraińskich pracowników. Biorąc pod uwagę brak wystarczających danych statystycznych dotyczących skali emigracji zarobkowej, potrzebnych do budowy wiarygodnych modeli ekonometrycznych, uzasadniono, że zastosowanie eksperckiej metody prognozowania pozostaje optymalną techniką oceny potencjalnych przepływów migracyjnych i systemów migracji.

Słowa kluczowe: aspiracje migracyjne, czynniki społeczno-ekonomiczne, prognoza, polityka migracyjna, Ukraina, Niemcy

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The Competitive Position of the Economy of Poland (against the Backdrop of the Visegrad Group Countries and the Baltic States) – Changes and Determinants in the Post-accession Period[1]

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Abstract

The article presents the results of an analysis that compares changes in Poland's competitive position against the backdrop of the Visegrad Group (V4) countries and the Baltic States (BS3) in the post-accession period (2006–2017). This type of study has not been presented in detail in the available literature before. Therefore, the article may significantly contribute to bridging the gap.
The study employs a comparative analysis of secondary data concerning the indices and pillars of economic competitiveness described in *The Global Competitiveness Reports* prepared by the World Economic Forum. An important element of the examination was the endeavour to identify major determinants of those developments. The article ends with a summary of the most significant conclusions from the analysis presented. As confirmed by the examination, the countries covered differed widely regarding the improvement of their competitive positions in the post-accession period.

Keywords: international economic competitiveness, international competitiveness of an economy, effects of EU membership, Baltic States, Visegrad Group countries, Visegrad countries, new EU Member States

JEL: E2, E6, F4, F5

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Introduction

Thanks to their accession to the European Union (EU), the majority of the new Member States experienced rapid economic growth accompanied by restructuring and modernisation. It considerably improved the international competitive positions of their economies (for more on the subject see Molendowski 2015, pp. 5–18).

The article presents the results of an analysis that compares changes in the competitive position of Poland's economy against the backdrop of the Visegrad Group (V4) countries, i.e. Poland, Hungary, Slovakia, Czechia aswell as the Baltic States (BS3), i.e. Estonia, Lithuania, and Latvia, in the post-accession period (2004–2017). Among the countries under examination, Poland is considered to be one of the most successful in improving the competitive positions of their economies after joining the EU (Molendowski and Folfas 2019; Wołkonowski 2019).

The analysis was based on the indicators presented in *The Global Competitiveness Reports* prepared by the World Economic Forum. The reports contain some of the most comprehensive and most frequently quoted rankings of international economic competitiveness. The assumption is that the EU accession had a considerable impact on the development of the competitive position, but specific effects varied between countries. The examination also attempts to identify the influence of the most important factors (pillars) on the competitive positions of the countries covered in the period in question. According to the World Economic Forum experts, the countries in question should already be at a stage of building their competitive positions based on efficiency enhancers as well as on innovation and sophistication factors. The analysis presented in the article aims to verify that assumption.

This objective determined the structure of the article. The text begins with an introduction indicating the context and purpose of the study. The substantive part of the article is divided into four sections. The first section presents a review of major publications in the literature concerning the phenomenon of competitiveness and the international competitive position of an economy. Section two describes the measures and methods of measuring international economic competitiveness applied in the study presented. Sections three and four discuss the most important findings from the analysis. The focus is on the description of changes in Poland's competitive position against the backdrop of the countries under examination and on the factors that determine those developments in the post-accession period (2004–2017).

It is worth stressing that the international competitiveness of economies has been addressed by a number of researchers, but the literature continues to lack studies and analyses covering the V4 countries or the Baltic States. The few studies on the subject include the following publications: Misztal (2009), Falkowski (2018), Kerikmäe, Chochia and Atallah (2018), Molendowski (2017). The article adds value by presenting the most significant results achieved in the process of building the international position of Poland compared to the economies under analysis. The article seems to be a major contribution to bridging the still existing gap in that regard.

Competitiveness and the international competitive position of an economy – a review of major publications in the literature

The notion of international economic competitiveness arouses much controversy. While using the category of competitiveness with regard to an enterprise is widely recognised, applying it to the economy as a whole has been frequently challenged.

The concept of the competitiveness of an economy was most fiercely 'attacked' by P. Krugman in his article 'Competitiveness: A Dangerous Obsession' (Krugman 1994, p. 28). He considered drawing an analogy between the competitiveness of corporations and that of countries to be meaningless and contrary to foreign trade theories.

In his criticism, he put forward three arguments:

- corporations that become uncompetitive fall into financial distress over time and, as a result, cease to exist;
- competition between enterprises is a zero-sum game;
- export competitiveness determines the success of small and open economies; therefore, the phenomenon of competitiveness is not a universal idea (cf. Molendowski 2017, pp. 6–8).

But supporters of the concept of economic competitiveness believe it to be a 'modern' approach to fundamental problems of economic development in conditions of globalisation (Reinert 1995, pp. 23–24; Radło 2008, p. 77). In their opinion, it is essential to answer the following questions regarding an economy's international competitiveness: Why do countries vary in socio-economic performance? What are the reasons for such differences? How can national development be shaped and the welfare of the population be improved based on the maximisation of long-term benefits of international trade (Wysokińska 2001, p. 37; Martin 2003, p. 7).

In reply to P. Krugman's concerns about the competitiveness of an economy being unfounded due to the impossibility of defining its bottom line, it is worth looking at the issue as a long-term phenomenon, with structural characteristics (Wziątek-Kubiak 2004, pp. 805–807; Jagiełło 2008, p. 13). It is an element that distinguishes economic competitiveness from business or sectoral competitiveness, representing efficiency-related categories. In the long term, the competitiveness of an economy may be improved through the development of trade specialisation as a result of structural adjustments and quality changes, mostly on account of the technological capacities of the country concerned (Miozzo and Walsh 2006; Alvarez and Marin 2010; Majewska-Bator 2010). Therefore, economic competitiveness is inextricably connected with economic development and must be seen as a dynamic category (Jagiełło 2008, p. 14; Radło 2008, p. 4; Weresa 2008, p. 102).

As regards the second argument put forward by Krugman, national economies are international competitors. It is worth remembering that the comparative advantage

theory, referred to by Krugman in his criticism, is based on a central assumption of the lack of factor mobility (Kojima and Ozawa 1985, p. 136). According to the concept of locational competition, in conditions of the free movement of production factors, competition is reflected in rivalry for those factors: capital, technological knowledge and skilled labour (Siebert 2006). A more efficient use of production factors, in particular of intangible resources (innovation, cultural standards, organisation and management skills), becomes the foundation for structural adjustments and leads to changes in the competitiveness of economic sectors (Porter 1990; Cho, Moon 1998). Therefore, it can be assumed that countries characterised by similar development levels keep struggling for the provision of convenient conditions for a skilled workforce and for the location of economic activities in innovative industries.

It also seems important to attempt to rebut the argument of the non-universal nature of the concept of economic competitiveness with regard to large countries. Due to ongoing globalisation and the convergence of consumer preferences on a global scale (Mrak 2000), producers from large countries – theoretically, still mainly relying on domestic sales – are exposed to competition from innovative foreign products (Karodia et al. 2014). Although economic growth in a large country is not directly dependent on export competitiveness, in the days of a global economy, international rivalry at the corporation level spreads to national markets. As a result, even a large and industrialised economy cannot ignore competitive pressure from innovation leaders or more cost-effective foreign businesses. Thus, in an open economy, the capabilities to take globalisation-related opportunities but also to cope with threats from international competitors are reflected in job creation in the country concerned and, as a consequence, in economic growth (Howes 2000, p. 180).

The arguments presented above make it possible to justify addressing the competitiveness of national economies in the days of ongoing globalisation. However, it remains open to question how to define the substance of the phenomenon. A snowballing increase in the number of opinions voiced on economic competitiveness has led to chaotic concepts (Gomułka and Czajkowski 2008, p. 16). However, despite terminological incoherence, it is commonly accepted that the notion of the international competitiveness of an economy can be divided into supplementary factor- and outcome-based elements (Radło 2008, pp. 76–78; Adamkiewicz 2019, pp. 30–31).

Outcome-based competitiveness – referred to as the competitive position – represents the place of a country in the global economy in a static approach (Weresa 2008, p. 102). It is reflected in the country's share in international trade, indicating the position achieved in the trade in goods, services, and in international flows of production factors (Misala 2011, p. 80). The situation translates into the country's position and advancement in the modern international division of labour and, consequently, through increased salaries and wages, to the improved welfare of the population (Wysokińska 2001).

Assessing the 'competitive position', as a starting point in competitiveness analysis, makes it possible to estimate the degree of a country's integration into the interna-

tional division of labour at that time (a static approach). In contrast, an examination of movements of that position over time allows to determine the 'competitive ability' (a dynamic approach). The reasons for the position achieved and determinants of any changes are to be sought 'deeper' – by analysing factor-based competitiveness (Gomułka and Czajkowski 2008, p. 29; Weresa 2008, p. 102).

Each of the categories described above is relative; they must be considered in relation to other countries but also in the context of the development stage of the economy under investigation (for more on the subject see Żmuda and Molendowski 2016, pp. 323–333).

Measures and methods of measuring international economic competitiveness

In recent years, there have been various measures of the international competitiveness of national economies, and thus a number of measurement methods. It concerns both measuring the competitiveness of a country's economy and its international competitive position in the period under analysis. The determinants of the competitiveness of individual countries have been investigated by many researchers and international centres.

One of them is the International Institute for Management Development (IMD). It publishes its research results in annual reports entitled the World Competitiveness Yearbook, covering several dozen countries. In addition, since 2004, the World Bank has prepared its annual Doing Business reports, which investigate the conditions of pursuing economic activities in the countries under examination. Assessments of international economic competitiveness relatively often rely on the Foreign Direct Investment Confidence Index prepared annually by the consulting firm A.T. Kearney. A country's international competitiveness is also measured by the Human Development Index (HDI), a composite measure of the country's quality of life, published annually by the UNDP.

One of the most comprehensive and most frequently quoted rankings is considered to be that of the international competitiveness of economies: *The Global Competitiveness Report*. It is the product of a comparative study of economic development conditions in individual countries prepared on an annual basis by the World Economic Forum.[2] The countries covered are ranked in terms of competitiveness measured by an

2 The report was first published in 1979 and has gradually covered an increasing number of countries (140 in 2017). Initially, it contained a ranking based on the Competitiveness Index designed under the supervision of Prof. J. Sachs, and indicated the foundations of fast economic development in the medium and long term. In 2000, at the initiative of Prof. J. Sachs, a new index calculation methodology was introduced, and the name was changed to the Growth Competitiveness Index, to distinguish it from the current microeconomic competitiveness index used under various names in a number of reports. In 2004, it was replaced by the Global Competitiveness Index, covering not only macroeconomic determinants but also microeconomic factors that facilitiate

index developed for this purpose. It is calculated on the basis of 114 factors grouped into 12 pillars divided into three categories: basic requirements, efficiency enhancers, as well as innovation and sophistication factors. The first category of factors includes the following pillars: institutions, infrastructure, macroeconomic environment, health, and primary education. The second category comprises the following pillars: higher education and training, goods market efficiency, labour market efficiency, financial market development, technological readiness, and market size. The third category includes business sophistication and innovation (WEF 2017, p. 12). For each pillar, individual countries receive scores of 1 to 7, where 1 and 7 denote the lowest and the highest possible scores, respectively (WEF 2017, pp. 20–24).

In order to compute the composite indicator of the competitive position, it is essential to place the country concerned in the relevant group that defines its stage of development. The weights assigned to specific pillar groups depend on the value of GDP *per capita* of the country in question. They are presented in Table 1.

Table 1. Weights of the determinants of the competitive position of a country according to the stage of development (GDP *per capita)*

Specification	Stage 1: factor-driven	Transition from stage 1 to stage 2	Stage 2: efficiency-driven	Transition from stage 2 to stage 3	Stage 3: innovation-driven
GDP *per capita* (in USD)	<2000	2,000–2,999	3,000–8,999	9,000–17,000	>17,000
Weight for basic requirements (in %)	60	40–60	40	20–40	20
Weight for efficiency enhancers (in %)	35	35–50	50	50	50
Weight for innovation and sophistication factors (in %)	5	5–10	10	10–30	30

Source: WEF 2017, p. 320.

As follows from the data presented in Table 1, in the WEF ranking, basic requirements are of key importance to economies whose development is mostly based on traditional factors of production (their GDP *per capita* does not exceed USD 2,000). Efficiency enhancers are crucial for economies mainly driven by investment (GDP *per capita* of USD 3,000 to USD 17,000). Innovation and sophistication factors are particu-

the assessment of a country's ability of to achieve economic growth. Another modification to the index was introduced in 2008 at the initiative of Prof. M.E. Porter and consisted in the inclusion of productivity determinants, believed to significantly influence the standards of living in individual countries (WEF 2009, pp. 3–7). Data currently published by the WEF according to the methodology concerned cover a period from 2006. In 2019, the WEF ranking methodology was significantly changed, and the most recent results are not comparable to those presented in the previous editions of the report. The GCI scores were only re-estimated according to the new guidelines for 2017 (WEF 2019, pp. 1–3).

larly vital to countries whose development is innovation-driven. They are countries at the top (third) stage of economic development (their GDP *per capita* exceeds USD 17,000). It is worth emphasising that efficiency enhancers were assigned relatively the highest weight among the determinants of a country's competitive position. At the same time, basic requirements play a relatively significant role in defining the competitive position of the lowest-income countries. The classification of the countries covered by the presented analysis based on those assumptions is shown in Table 2.

Table 2. Classification of the EU–10 by stage of development with GDP *per capita* thresholds

Stage of development	Year	
	2006/2007	2017/2018
Stage 2: efficiency-driven	Bulgaria, Lithuania, Latvia, Poland, Romania, Slovakia	Bulgaria
Transition from stage 2 to stage 3	Czech Republic, Estonia, Hungary	Lithuania, Latvia, Poland, Romania, Hungary, Slovakia
Stage 3: innovation-driven	Slovenia	Czech Republic, Estonia, Slovenia

Source: prepared by the author based on WEF 2008, p. 9; WEF 2018, p. 320.

It follows from the above presentation that the weights in the 2006–2018 World Economic Forum (WEF) Reports considerably changed for particular determinants of the international competitive positions of the EU–10 economies. According to that assumption, in 2006, the majority (six) of the countries covered would have shaped their competitive positions mostly based on efficiency enhancers (50%) and basic requirements (40%). In contrast, in 2018, six of the countries under analysis should show significantly diminished importance of basic requirements (from 40% to 30%) in favour of innovation and sophistication factors (from 10% to 30%), while in three of them, the most essential role, in addition to efficiency enhancers (50%), should be played by innovation and sophistication factors (30%).

Changes in the competitive position of Poland against the backdrop of the Visegrad Group countries and the Baltic States

According to the results of the economic competitiveness studies carried out by the WEF, in the post-accession period, the international competitive positions of Poland, the V4 and the BS3 showed significant changes (cf. Table 3). While in the first years after accession Poland ranked the lowest (60th) among the countries covered, the following years witnessed an almost steady rise. It is worth emphasising that its position showed particular improvement in the first years after accession (2005–2007). Over three years, the Polish economy moved to 45th place (up as many as 15 spots). During the global crisis, that positive trend was arrested, but from 2013 (to 2016), a marked

advancement was noted again. It is worth emphasising that throughout the period in question (until 2018), Poland improved its rank by as many as 21 spots.

An important element of the analysis presented was to compare the scores obtained by Poland with those of the other countries covered. It is common knowledge that those were the most successful transition economies among all the Central and Eastern European countries. Joining the EU triggered sustainable changes and building firm and stable foundations for further development. However, they varied rather widely in terms of competitiveness scores (cf. Table 3 and Chart 1). At the beginning of the period covered, Poland was assessed relatively the worst.

Poland's place differed considerably from the positions of the Visegrad Group (V4) countries. At the time, the Czech Republic, Hungary and Slovakia ranked much higher (40th, 39th and 43rd place, respectively). The Baltic States were considerably ahead of Poland as well, with the WEF ranking Estonia, Latvia and Lithuania 20th, 36th and 44th, respectively.

In the following years, until 2007, Poland continued to be ranked lower than the other V4 countries and the Baltic States. In 2008, Hungary fell below Poland, joined by Slovakia, Latvia and Lithuania in 2009. Between 2010 and 2012, Poland ranked higher than five out of the seven countries covered. The same situation was observed until the end of the analysed period (2017). As a result, in 2017 only Estonia and the Czech Republic ranked higher than Poland. Therefore, ranking 39th, Poland showed the greatest advancement (in comparison with the countries under examination), up as many as 21 spots (by 0.61).[3] Apart from Poland, only the Czech Republic improved its position (by nine places and 0.22). At the same time, six countries fell in the ranking, including Hungary (down 21 spots), Slovakia (down 16 spots) and Slovenia (down 15 spots).

As a result of those developments, in 2017, Poland joined the WEF ranking leaders (the Czech Republic, Estonia and Lithuania) among the countries under analysis.

Table 3. Global Competitiveness Index scores of the Polish economy against the backdrop of the V4 and BS3 economies in 2006–2017*

Report edition	PL		CZ		HU		SK		EE		LT		LV	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
2004/2005	60	3.98	40	4.55	39	4.56	43	4.43	20	5.08	36	4.57	44	4.43
2005/2006	51	4.00	38	4.42	39	4.38	41	4.31	20	4.95	43	4.30	44	4.29
2006/2007	45	4.39	31	4.67	38	4.49	36	4.54	26	4.82	39	4.49	44	4.47
2007/2008	51	4.28	33	4.58	47	4.35	41	4.45	27	4.74	38	4.49	45	4.41
2008/2009	53	4.28	33	4.62	62	4.22	46	4.40	32	4.67	44	4.45	54	4.26
2009/2010	46	4.33	31	4.67	58	4.22	47	4.31	35	4.56	53	4.30	68	4.06
2010/2011	39	4.51	36	4.57	52	4.33	60	4.25	33	4.61	47	4.38	70	4.14
2011/2012	41	4.46	38	4.52	48	4.36	69	4.19	33	4.62	44	4.41	64	4.24
2012/2013	41	4.46	39	4.51	60	4.30	71	4.14	34	4.64	45	4.41	55	4.35

3 For more on the subject see: Boguszewski 2016, pp. 21–28.

Report edition	PL		CZ		HU		SK		EE		LT		LV	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
2013/2014	42	4.46	46	4.43	63	4.25	78	4.10	32	4.65	48	4.41	52	4.40
2014/2015	43	4.48	37	4.53	60	4.28	75	4.15	29	4.71	41	4.51	42	4.50
2015/2016	41	4.49	31	4.69	63	4.25	67	4.22	30	4.74	36	4.55	44	4.45
2016/2017	36	4.56	31	4.72	69	4.20	65	4.28	30	4.78	35	4.60	49	4.45
2017/2018	39	4.59	31	4.77	60	4.33	59	4.33	29	4.85	41	4.58	54	4.40
2018/2004	21	0.61	9	0.22	–21	0.23	–16	0.10	–9	0.23	–5	0.01	–10	0.03

* A – Rank, B – GCI score
Source: prepared by the author based on WEF 2015, WEF 2018.

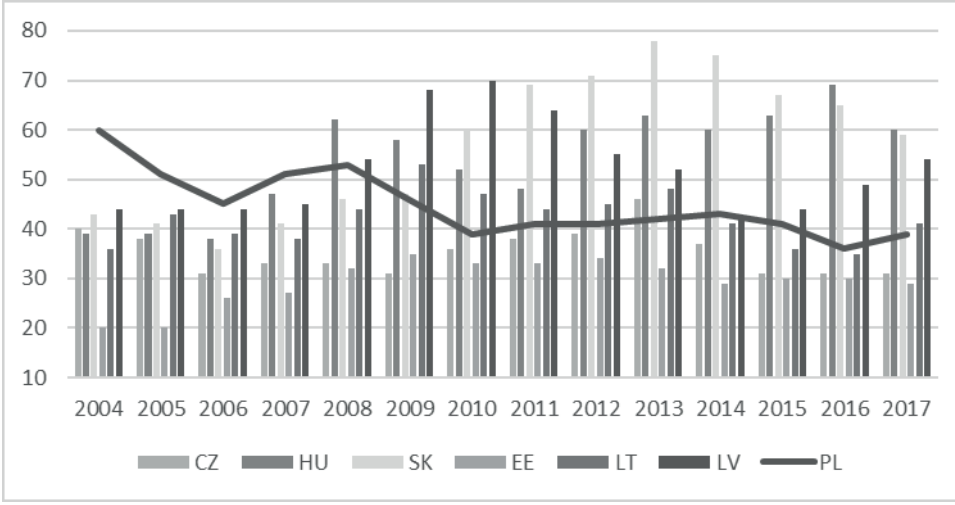

Chart 1. Changes in the competitive position of Poland against the backdrop of the Baltic States and the V4 countries (in 2006–2017)
Source: prepared by the author based on the data used in Table 3.

To recapitulate, throughout the period 2004–2017, the most favourable situation in terms of international competitive position was observed for the Czech Republic and Estonia, in addition to Poland. However, the countries in question were unable to match the achievement of the Polish economy. In contrast, the other two Baltic States, as well as Hungary and Slovakia, dropped in the ranking in 2017 compared to 2004, even though their GCI (Global Competitiveness Index) scores showed some improvement.

Determinants of the competitive position of Poland (against the backdrop of the Visegrad Group countries and the Baltic States)

As already mentioned above, it follows from *The Global Competitiveness Reports* prepared by the World Economic Forum that the analysed countries should show a much greater significance of efficiency enhancers as well as innovation and sophistication factors in shaping their competitive positions. While in 2006 basic requirements played a relatively important role, by 2017 they had diminished in importance (in favour of efficiency enhancers and innovation and sophistication factors). In the analysis presented, it was decided to verify whether such a trend could be observed. The examination was based on the data shown in Table 4.

It follows from the data presented in Table 4 that in 2006, the competitive positions of the V4 countries were mostly driven by basic requirements (pillars). The GCI score of the group in question was 4.62, far above the overall GCI score of 4.39 (with a difference of 0.24). A similar situation was also observed in the other countries covered, although basic requirements contributed relatively the most to the overall GCI score in the case of Estonia (the respective difference was 0.46).

Efficiency enhancers (sub-index 2) represented the second most significant group of factors in Poland, as well as in all the countries under examination. They played relatively the greatest role (which must be assessed positively) in Estonia, the Czech Republic and Slovakia. As regards Poland, the GCI score for this group of factors was similar to the overall GCI score.

The pillars included in group 3 (innovation and sophistication factors) contributed relatively the least to the scores obtained by all the analysed countries. It was particularly observed in Latvia, Estonia, Slovakia, Poland and Lithuania.

Table 4. Effects of specific factors on the competitive position of Poland against the backdrop of the V4 countries and the Baltic States in 2006 and 2017

Specification	GCI score in 2006								GCI score in 2017							
	PL	CZ	HU	SI	SK	EE	LT	LV	PL	CZ	HU	SI	SK	EE	LT	LV
OVERALL GCI SCORE	4.39	4.67	4.49	4.48	4.54	4.82	4.49	4.47	4.59	4.77	4.33	4.48	4.33	4.85	4.58	4.40
A. Basic requirements	4.62	4.94	4.71	5.18	4.76	5.28	4.91	4.84	4.99	5.35	4.65	4.57	5.14	5.66	5.15	5.01
1. Institutions	3.64	3.89	4.21	4.26	3.98	4.67	3.79	3.96	3.84	4.16	3.46	3.70	4.05	5.04	4.13	3.76
2. Infrastructure	3.29	4.42	3.85	4.35	3.72	4.34	4.04	3.85	4.70	4.61	4.36	3.82	4.80	5.09	4.65	4.40
3. Macroeconomic environment	5.10	5.43	4.53	5.62	5.41	5.87	5.62	5.44	5.20	6.23	5.13	5.25	5.23	6.07	5.61	5.77
4. Health and primary education	6.46	6.04	6.23	6.48	5.95	6.25	6.19	6.09	6.22	6.40	5.65	5.49	6.49	6.43	6.20	6.11
B. Efficiency enhancers	4.33	4.59	4.48	4.42	4.50	4.69	4.28	4.35	4.65	4.86	4.44	4.28	4.39	4.92	4.57	4.40
5. Higher education and training	4.73	4.95	4.87	5.08	4.45	5.22	4.93	4.89	4.98	5.25	4.33	4.41	5.37	5.52	5.16	4.95
6. Goods market efficiency	4.26	4.69	4.42	4.60	4.59	5.01	4.38	4.48	4.55	4.66	4.38	4.14	4.64	5.09	4.57	4.42
7. Labour market efficiency	4.44	4.62	4.50	4.36	4.73	4.74	4.43	4.58	4.14	4.49	4.21	3.97	4.10	5.02	4.33	4.47
8. Financial market development	4.10	4.36	4.58	4.53	4.95	4.76	4.36	4.82	4.17	4.80	4.31	3.74	3.45	4.85	4.10	4.05
9. Technological readiness	3.39	4.38	3.97	4.27	4.12	5.05	3.79	3.87	4.89	5.50	5.09	4.78	5.37	5.91	5.62	5.27
10. Market size	5.06	4.55	4.52	3.67	4.16	3.36	3.78	3.49	5.17	4.49	4.33	4.61	3.41	3.10	3.62	3.24
C. Innovation and sophistication factors	3.73	4.39	4.06	4.11	3.82	4.03	3.83	3.59	3.75	4.24	3.52	3.28	4.18	4.20	4.04	3.65
11. Business sophistication	4.03	4.80	4.40	4.61	4.21	4.38	4.31	4.11	4.11	4.61	3.68	3.47	4.38	4.36	4.35	4.07
12. Innovation	3.43	3.97	3.73	3.62	3.43	3.69	3.35	3.08	3.40	3.87	3.36	3.08	3.98	4.04	3.73	3.22

Source: prepared by the author based on WEF 2015, WEF 2018.

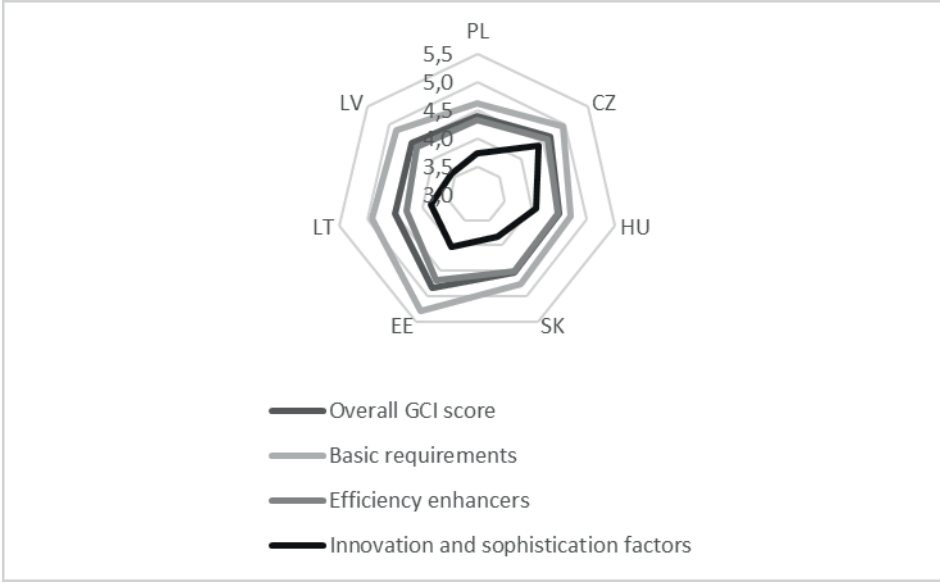

Chart 3. Determinants of the competitive position of Poland against the backdrop of the other V4 countries and the Baltic States in 2006
Source: prepared by the author based on Table 4.

Interestingly, it follows from the data presented in Table 4 that in 2006, in addition to market size, Poland's competitive position was mostly driven by health and primary education, higher education and training, as well as, labour market efficiency and innovation, although to a much lesser degree. Those pillars were classified as basic requirements or efficiency enhancers.

Obviously, in such studies, it is particularly crucial to examine long-term trends. Therefore, the analysis presented attempted to identify the most important trends characteristic of developments in the competitive positions of the countries covered in 2017 against 2006. Those changes are evident in the comparison of Charts 3 and 4.

The comparison of Charts 3 and 4 (and the data presented in Table 4) clearly shows an advancement in Poland's competitive position, not only in terms of the overall score but also with regard to basic requirements. The score for basic requirements (4.99) exceeded the overall GCI score (4.59). It means that the factors in question significantly gained in importance in shaping the competitive position and remained key drivers. It is worth stressing that in accordance with the WEF recommendations, it would have been more desirable to reduce the contribution of basic requirements to the competitive positions of countries at a similar stage of development to that of Poland (cf. Tables 2 and 3).

Changes in the score for efficiency enhancers must be evaluated as favourable. In 2004–2017, the score for the sub-index (4.65) rose by 0.32, whereas the overall GCI score went up by 0.21. Therefore, the trend was consistent with the WEF recommendations. But the score for innovation and sophistication factors remained much low-

er (3.75) than the overall GCI score (merely 0.03 above the 2006 level). With regard to the pillars in question, Poland recorded a relative deterioration rather than any improvement.

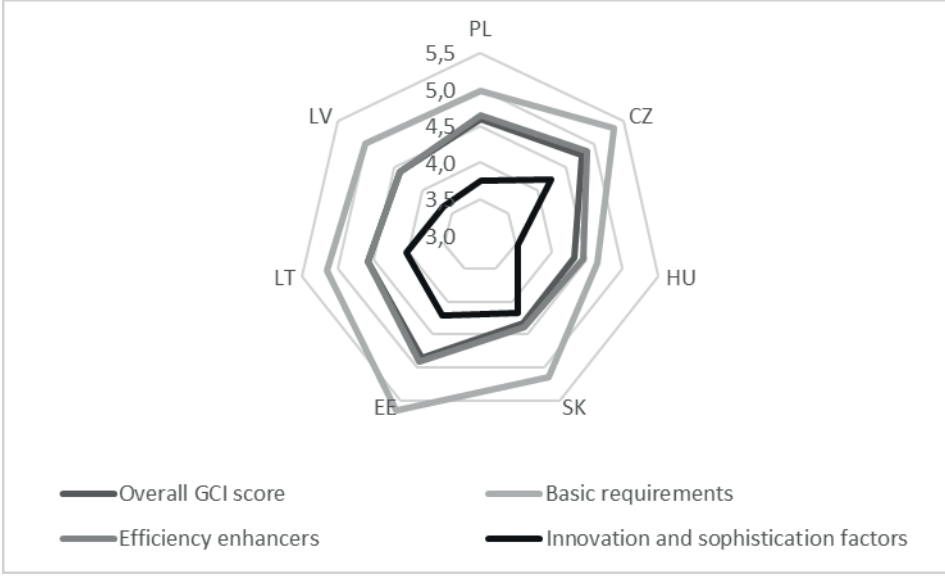

Chart 4. Determinants of the competitive position of Poland against the backdrop of the other V4 countries and the Baltic States in 2017
Source: prepared by the author based on Table 5.

To recapitulate, in 2006–2017 Poland's competitive position only showed improvement with regard to the effects of efficiency enhancers, whereas changes in the contributions of basic requirements and innovation and sophistication factors must be assessed as negative trends.

A similar situation was also observed in the other countries covered. It must be particularly emphasised that the score for basic requirements increased considerably in relation to the overall GCI score (whereas the WEF recommends reducing the role of the pillars in question). The growth was the most evident for the Czech Republic (by 0.20), Slovakia (0.17) and Estonia (0.17). As regards Lithuania and Latvia, their respective scores for basic requirements followed nearly the same trends as the overall GCI scores. Only Hungary recorded a marked decline in the score for basic requirements compared to the overall GCI score (by 0.27).

In the group of efficiency enhancers (whose contribution should be increased, according to the WEF recommendations), all the countries covered noted improved their scores. In the period in question, the most significant advancements were noted for Poland (up by 0.32), Lithuania (by 0.29), the Czech Republic (by 0.27) and Estonia (by 0.23). As regards the other countries (Hungary, Slovakia and Latvia), their respective GCI scores remained basically unchanged.

At the same time, in the group of innovation and sophistication factors (the WEF recommends increasing their role), the most distinct improvements in score were observed for Slovakia (by 0.36), Lithuania (by 0.21), and Estonia (by 0.17). The scores for Poland and Latvia remained virtually unchanged, whereas Hungary and the Czech Republic showed a decrease (by 0.54 and 0.15, respectively).

To recapitulate, the developments observed in the countries covered varied rather widely. Favourable changes concerning basic requirements only occurred in Hungary. Positive changes in efficiency enhancers were noted for Poland, Lithuania, the Czech Republic and Estonia. In the group of innovation and sophistication factors, marked improvements were only observed for Slovakia, Lithuania and Estonia. Simultaneously, the most adverse changes in basic requirements took place in Poland, the Czech Republic, Slovakia and Estonia; with regard to efficiency enhancers – in the case of Hungary, Slovakia and Latvia; in terms of innovation and sophistication factors – for Hungary and the Czech Republic.

Summary and conclusions

It follows from the review of major publications in the literature presented in the article that the competitiveness of an economy should be described dynamically, from the angle of the development of available (domestic and foreign) production factors, the ability to take opportunities related to ongoing globalisation, and the adaptability of businesses, sectors and the economy as a whole to the changing conditions in the external environment, thus – the achievement of development objectives. Such an approach to economic competitiveness was adopted by the authors of the Global Competitiveness Reports prepared by researchers associated with the World Economic Forum.

Thanks to their accession to the European Union, the majority of the new Member States experienced rapid economic growth accompanied by restructuring and modernisation. It considerably improved the international competitive positions of their economies.

Obviously, in investigations of changes in the competitive positions of economies and their determinants, a particular focus is on the study of long-term trends. Therefore, the analysis attempted to identify the most important trends characteristic of developments in the competitive positions of the countries covered in the period 2004–2017 and in their determinants in the period 2006–2017.

In the post-accession period, Poland appeared to be the most successful in improving the international competitive position of its economy among the countries under examination (moving up in the WEF ranking by 21 spots, from 60th place in 2006 to 39th in 2017). In the Visegrad Group (V4), the most favourable situation in that regard was noted for the Czech Republic (up nine spots). The other V4 countries experienced a deterioration (Hungary – down 21 spots, Slovakia – down 19 spots). As regards the

Baltic States (BS3), the most advantageous situation was noted in the case of Lithuania and Estonia. However, Estonia's rank dropped (as many as nine spots). Deteriorated ranks were also noted by Lithuania and Latvia (by 5 and 10 spots respectively). Thus, the countries in question were unable to match the achievement of Poland.

An important element of the presented analysis was an attempt at verifying the assumption that the V4 countries and the Baltic States should already (as recommended by the WEF) increasingly rely on building their international competitive positions mostly on efficiency enhancers and also, to a growing degree, on innovation and sophistication factors.

The analysis suggests that in the period in question, the scores for efficiency enhancers showed an upward trend in almost all analysed countries (with the exception of Slovakia and Hungary). Characteristically, however, in the case of Poland, efficiency enhancers gained in importance to the greatest degree.

The role of innovation and sophistication factors was rather limited in the countries covered. In this regard, in 2017 the situation was nearly the same as in 2006. Therefore, the trends actually observed were different from those recommended by the WEF experts.

An essential conclusion to be drawn from the analysis is that in 2017, these countries relied on basic requirements in shaping their competitive positions, contrary to the WEF recommendation to reduce their role.

The examination unambiguously shows that in the years to come, Poland and the other countries under review – to a greater degree than before – should build their competitive positions based on efficiency enhancers as well as on innovation and sophistication factors, especially on those previously underestimated.

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Pozycja konkurencyjna gospodarki Polski (na tle krajów Grupy Wyszehradzkiej oraz Krajów Bałtyckich) – zmiany i czynniki ją determinujące w okresie poakcesyjnym

Artykuł jest prezentacją wyników analizy, w ramach której podjęto próbę porównania zmian pozycji konkurencyjnej Polski na tle państw Grupy Wyszehradzkiej (GW–4) oraz Krajów Bałtyckich (KB–3) w okresie poakcesyjnym (lata 2006–2017). Należy podkreślić, że tego typu badanie nie było jeszcze szerzej prezentowane w dostępnej literaturze. Artykuł może być więc ważnym uzupełniniem tej luki.

W badaniu zastosowano metodę analizy porównawczej danych wtórnych, dotyczących wskaźników konkurencyjności gospodarki oraz czynników ją determinujących wyodrębnionych w Raportach „Global Competitiveness Report", opracowywanych przez Światowe Forum Ekonomiczne. Ważnym elementem prezentowanej analizy było podjęcie próby zidentyfikowania najważniejszych czynników determinujących te zmiany. Artykuł kończy zestawienie najważniejszych wniosków wynikających z prezentowanej analizy. Analiza potwierdziła, że badane kraje cechowały się dość istotnymi różnicami w zakresie poprawy ich pozycji konkurencyjnej w okresie poakcesyjnym.

Słowa kluczowe: międzynarodowa konkurencyjność gospodarki, efekty członkostwa w UE, Kraje Bałtyckie, państwa Grupy Wyszehradzkiej, Nowe Państwa Członkowskie UE

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Do Instabilities in National Macroeconomic Factors Contribute to Channeling Volatility Spillover from the Global to the Islamic Equity Market?

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Abstract

This study investigates the impact of macroeconomic instabilities on returns volatility spillover that is transmitted from the global to the Islamic equity market. The economic factors examined are the exchange rate, inflation rate, interest rate, and production growth. To achieve the purpose of the study, we utilize three analysis tools: a GARCH(p,q) model to derive values of volatility for all variables; an asymmetry dynamic conditional correlation (ADCC) model to produce a measure of volatility spillover as the dependent variable; and a panel data regression technique to assess the causality significance of macroeconomic factors to volatility spillover. This study is the first which expands such approaches. We observe monthly data of world and Islamic market indices, exchange rates, consumer price indices, interest rates, and industrial

production indices. The data, which range from May 2002 to February 2019, are taken from the world market, and twenty-three economies, which consist of fourteen developed and nine emerging markets that have Islamic stock indices. In several sections, we provide important additional analysis for five stock markets in Central European economies, which are compared to the others. The finding suggests that the presence of volatility spillover on the Islamic markets that originates from the global market is affected by the internal instabilities of macroeconomic factors, except for industrial production instability for developed markets, including Central European markets. An implication of the study is that regulators should anticipate and prevent adverse consequences of volatility spillover by arranging their internal economic policy to control inflation rates, interest rates, and industrial production growth, as well as exchange rate flexibility. Moreover, market practitioners should include both global market volatility and macroeconomic instabilities in their prediction to create minimum risk.

Keywords: volatility spillover, Islamic equity, GARCH model, ADCC, panel data

JEL: F36, G15, C10, C23

Introduction

Many studies have investigated the relationship between the equity market and real economic activities. Interest in this area is mainly because equity markets are recognized as playing a prominent role in an economy's economic and business cycle developments (Zakaria and Shamsuddin 2012). Due to their important role as a financial channel for savings and investment for investor wealth, corporate performance, and economic development, it has drawn the attention of researchers and practitioners. They continue to examine the behavior and condition of the equity markets, as well as domestic financial-economic factors and factors originating from the global market that change their development.

Although maximizing stock returns for an investor in the equity market is an expectation that is accompanied by high risk, many recent articles pay more attention to creating minimum risk with the same rate of returns. This risk could be observed through the volatility of the stock price. Therefore, the study of return volatility is important as it attempts to predict its pattern individually and to identify its determinants. In particular, how global market volatility and macroeconomic instability affect market returns become an interesting issue to be investigated further. Accordingly, investors develop their analysis by involving macroeconomic factors while national policymakers manage and control them to achieve benefits from the integration process more than its economic costs.

In line with the increased process in global economic and financial market integration to establish a single market and regional monetary unions, such as in South East Asia, Gulf, Latin America, and Eastern Europe, the sensitivity of an equity market could rise. As a result, the domestic equity market will become more responsive to the

volatility of global and regional markets. For instance, Prasad et al. (2018) found that larger equity markets from advanced western economies, particularly the US, dominate volatility transmission to other markets. They concluded that the level of volatility in one market relative to that in other markets is the most important factor in increasing transmitted spillovers. In addition, they include macroeconomic news as another important determinant for volatility spillover.

A market-oriented policy such as deregulation of interest and exchange rates and reductions in the restrictions to international fund flow has driven world market integration (Balli et al. 2015). However, this process has been accompanied by instability in market conditions, such as increased return volatility from global market volatility and financial fragility. We predict that a higher degree of equity return volatility is generally associated with countries characterized as having lower macroeconomic stability. Accordingly, such policy should consider not only the advantages of world market integration but also volatility spillover in market returns.

Volatility spillover has been the focus of many studies. Due to globalization and financial market liberalization, integrated domestic financial assets might not be protected from shocks from world markets. The returns volatility in an integrated domestic market would be influenced by the pattern of returns volatility in the world market (Jebran et al. 2017; Najmudin 2019). We predict that the endurance capability of an equity market could reduce this volatility spillover effect. Investigations into the factors that cause volatility spillover are thus necessary, and they will provide clear information and frameworks for decision-makers to control their policies so that equity market stability desired by market participants would be realized.

The financial economics literature has extensively examined the effect of macroeconomic variables on returns volatility and reported valuable findings. This issue has been observed in many economies, for instance, Finland (Liljeblom and Stenius 1997), the UK (Morelli 2002), Ghana (Adjasi 2009), Nigeria (Oseni and Nwosa 2011), Malaysia (Zakaria and Shamsuddin 2012), the US and 61 other economies (Georgiadis 2016), India (Haokip 2018), and Indonesia (Robiyanto et al. 2019), with various methods and observation periods. However, the literature has not provided evidence on the effect of national macroeconomic instability on volatility transferred from the global to a domestic Islamic market.

Prior studies found that various national macroeconomic volatilities, such as production growth as well as interest, exchange, and inflation rates, are explanatory variables for market returns volatility. We propose the explanatory variables as found in prior studies as potential determinants for the volatility spillover. Moreover, one of the weaknesses of prior studies lies in the measure of volatility spillover when it applies as a consequence factor. The advancement of analytical methods is necessary because of the consideration that the spillover volatility process changes over time due to the dynamic development of changing economic and business factors (Guesmi and Teulon 2014). Unlike previous studies, where market returns volatility has a position as an endogenous variable in examining the causality from macroeconomic variables,

we design the volatility spillover for a similar position. In addition, most studies emphasize conventional equities in both developed and emerging markets when investigating this issue. Studies on volatility spillover and its determinants that observe and involve the Islamic equity market are still rare, however. The results of such a study are interesting as the response to macroeconomic volatility could vary between an Islamic equity market and its conventional counterpart.

As the volatile nature of market returns provides important implications for policymakers and market practitioners, the purpose of this study is to investigate the connection between volatility spillover and several macroeconomic factors. We attempt to analyze how the strength of national economic stability can have a vital role in monitoring unwanted effects, particularly the volatility from the global market.

Literature review

The link between macroeconomic factors and stock price movement has been examined in the financial literature in two categories. The first studies assessed the link at the first moments, with the findings mostly suggesting that macroeconomic factors play a significant role in explaining patterns of equity market returns. The second studies assessed the link at second moments. The findings of the studies have a varied conclusion about how volatilities in macroeconomic factors affect equity market volatility. The link in the former studies analogically has a similar framework with the latter studies, which assumed that volatilities in macroeconomic factors such as production growth play an important role in determining equity market volatility.

Following Morelli (2002), Liljeblom and Stenius (1997) theorize about a link between equity price and macro variables. The theoretical motivation for the link at second moments can be described by the discounted present value of expected future cash flows for equity price. It states that the conditional variance of equity price depends on conditional variances of expected future cash flows and future discount rates, and on conditional covariances between them. A change in future macroeconomic instability would drive a proportional change in equity returns volatility as corporate equity values at the aggregate level should depend on economic health (Adjasi 2009).

The link between volatilities in an equity market and the number of macroeconomic variables originates from the theoretical formulation that equity prices are determined by a simple discounted present-value model (Morelli 2002), as expressed in Eq. (1).

$$E_{t-1}P_t = E_{t-1}\sum_{k=1}^{\infty} D_{t+k} \,/(1+R_{1+k})^k \,, \tag{1}$$

where D_{t+k} denotes the future dividend at time $t + k$; $1/(1 + R_{t+k})^k$ is the discount rate at time $t + k$; and E_{t-1} denotes the conditional expectation.

Theoretically, a simple discount model states that the fundamental value of corporate equity equals the present value of expected future dividends (Oseni and Nwosa 2011). The future dividend ultimately reflects real economic activity. Currently, if all the available information is taken into account, there would be a close relationship between equity prices and expected future economic activity. Similarly, volatility in equity price should also depend on the volatility of expected future cash flows and the future discount rate. In other words, the equity market would be volatile when real economic activity fluctuates (Zakaria and Shamsuddin 2012).

In addition, the arbitrage pricing theory (APT) introduced by Ross (1976) offers space to include several factors, such as macroeconomic variables, in the model, where their roles could be as a function of returns volatility. Furthermore, Chinzara (2011) argues that the dividend discount model and the APT propose an important theoretical framework underlying the link between patterns in economic condition and equity price. Both models predict that the arrival of new information, such as the interest rate, would alter the equity return through a change in the expected dividend and discount rate. Accordingly, it would be logical that volatility in economic variables would become a function of current returns volatility.

When the integration of an equity market with a global market increases, the sensitivity of this market to volatility spillover would also increase and be more vulnerable to external shocks (Alotaibi and Mishra 2015). However, we predict that when volatilities in national economic factors are stable, the volatility spillover would not fluctuate, as volatility in market returns does not fully depend on a change in global market volatility. Indeed, fully closed economies would not experience a volatility spillover, but they would grow and develop more slowly in the long run. For this trade-off, a market openness and its consequences should be considered carefully before the policies are decided.

The significance of volatilities in macroeconomic factors on an equity market's volatility spillover could define the integration type of the market towards the global market. The significant effect of volatilities in macroeconomic factors indicates that an equity market is segmented as it is still restricted by domestic internal factors. Policymakers or regulators have a role in controlling equity market instability when volatility is transmitted from the global market. Conversely, the insignificant effect of the volatilities indicates that an unstable economic situation cannot prevent volatility moving from the global to the domestic equity market. It suggests that this equity market is integrated into moving together internationally with other equity markets.

To estimate volatility patterns accurately, it is very important to understand the link between different equity market types, their price determinants, and the underlying factors behind their price fluctuations (Karali and Ramirez 2014). Moreover, Georgiadis (2016) concludes that the spillover depends on a number of internal characteristics in an economy, including financial integration, market openness, exchange and interest rate, as well as industrial production growth. As a result, macroeconomic stability has become necessary for financial development (Adjasi 2009). Georgiadis confirms

that investment plans and financial sector returns are driven largely by macroeconomic fundamentals. Thus, volatility in the stock market can be influenced by uncertainty in macroeconomic variables.

Four determinants of volatility spillover were assessed by Yusof and Majid (2007) in Malaysia. They observed the causality of monetary policy variables such as narrow money supply, broad money supply, interest rates, and exchange rates on conditional volatilities of conventional and Islamic stock markets. They used the Kuala Lumpur Composite Index (KLCI) as a measure for the conventional stock market return and the Rashid Hussain Berhad Islamic Index (RHBII) as a measure of the Islamic stock market return. The evidence suggests that the volatility of the KLCI is affected by interest rate volatility. In contrast, the volatility of RHBII is not affected by the volatility of the interest rate.

The results from Adjasi (2009) show that higher volatility in prices, which is an indicator of inflation volatility, and interest rates increase the stock return volatility. Inflation could reduce earnings after taxes, so then it has a negative effect on stock returns, and interest rate changes help predict equity market returns over a long period. Similarly, Chinzara (2011) reports that volatilities in inflation, as well as the price of gold and the price of oil, have a role in influencing stock market volatility. In addition, he finds that short-term interest rates and exchange rates are the most important.

Liberalization in the exchange rate and financial integration tend to amplify returns volatility spillover when developing countries have inflexible exchange rates (Georgiadis 2016). In other words, exchange rate volatility could influence the volatility of the equity markets due to international investors requiring foreign currencies to purchase equity in the international market (Leung et al. 2017). Moreover, Karali & Ramirez (2014) explain that the depreciation of a home currency against a foreign currency would increase returns on the foreign currency and drive investors to shift their fund from home securities to foreign securities, which would induce the equity price. Therefore, they assert that flexible exchange rates could help economies mitigate external shocks on the equity market.

A number of prior studies revealed determinants of volatility spillover in market returns. Liljeblom and Stenius (1997) employed simple weighted moving averages and GARCH (generalized autoregressive conditional heteroskedasticity) estimations as the analysis method and observed monthly data from January 1920 to 1991 in Finland. They utilized industrial production, money supply, inflation, terms of trade, and trading volume as the variables, and found weak evidence for a link between stock market volatility and the growth of stock market trading volume. Applying ARCH (autoregressive conditionally heteroscedastic) and GARCH models, Morelli (2002) analyzed the effects of volatility in industrial production, real retail sales, money supply, inflation, and exchange rate on conditional stock market volatility in the UK covering the period January 1967 to December 1995. He concluded that the volatility in the macro-variables observed does not influence stock market volatility. Observing in Ghana, Adjasi (2009) found that higher volatility in inflation and interest rates increases stock price volatility, while higher volatility in money supply reduces stock price volatility.

Recent studies, such as Prasad et al. (2018), apply the methodology from Diebold and Yilmaz (2012) to observe 16 stock markets. Using daily data over the period January 6, 2000 to June 13, 2014, Prasad et al. (2018) main finding is that larger stock markets from advanced western economies, particularly the US, dominate volatility transmission to other markets. Meanwile, Abbas et al. (2018) observed G–7 countries (the US, the UK, Canada, Japan, Germany, France, and Italy). They applied exponential GARCH and vector autoregressive (VAR) models to analyze equity market indices, the industrial production index, the consumer price index, broad money supply, the treasury bill rate, the exchange rate, and the crude oil price on a monthly basis. They reported a weak volatility transmission from macroeconomic factors to equity market volatility at the individual level, but the collective impact of volatility transmission is highly significant. The volatility of industrial production growth and the price of oil are identified as the most significant macroeconomic factors that could influence the directions of equity markets.

Data and methods

The first dataset includes monthly data for each market index from May 2002, the earliest month where complete Islamic market indices for the twenty-three markets became available, until February 2019. The indices' data are collected from nine emerging markets (the Czech Republic, Hungary, India, Indonesia, Korea, Malaysia, the Philippines, Poland, and Turkey), fourteen developed markets (Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, Singapore, Spain, Sweden, and the UK), and the world market. The Central European markets observed in the analysis are the Czech Republic, Hungary, and Poland, as well as Austria and Germany. Including the five markets as the sample, the result of this study could generalize statistically the population of markets that have incomplete data, such as Slovenia and Slovakia. The data set of twenty-three Islamic equity markets and world market indices are employed to calculate the returns on each market index. It would be used further to find the values of conditional variance as a measure of conditional volatility and coefficient set of asymmetric dynamic conditional correlation between the global market and each Islamic equity market.

Morgan Stanley Capital International (MSCI) continuously reports the data of Islamic indices for all the twenty-three equity markets and the global market. We chose the MSCI ACWI (All Countries World Index) as a proxy for the global market index. Data on equity market indices were converted into continuously compounded returns by subtracting the natural logarithm of the previous month's index from the natural logarithm of the current month's index, then multiplying by 100 to convert them into percentage returns. We calculate monthly market returns as $R_{t,i} = \ln(P_{t,i}/P_{t-1,i})$. This equation means that the return for market index i at current month t ($R_{t,i}$) is the result of the natural logarithm of price level of market index i at current month t ($P_{t,i}$), which is divided by the price level of market index i at the previous month t ($P_{t-1,i}$).

The second dataset includes monthly macroeconomic data of each of the twenty-three economies, namely the exchange rate with the US dollar, the consumer prices index, the treasury bill rate or central bank policy rate, and the industrial production index. For further analysis, we changed the exchange rate and interest rate data in volatility form, utilizing the GARCH model. In addition, we use percentage changes (denoted as %Δ) in consumer price and industrial production index data to generate the inflation rate and economic growth indicators, respectively. The data are available at msci.com, bloomberg.com, and international financial statistics (IFS) reported by the International Monetary Fund (IMF).

The method for this study is composed of three steps, which employ the GARCH model, the asymmetric generalized dynamic conditional correlation (ADCC) model, and panel data estimation. In the first step, the GARCH(1,1) procedure is utilized to produce conditional volatilities of global and national equity market returns, exchange rates, inflation rates, interest rates, and industrial production growth, respectively. Several empirical studies have employed the GARCH(1,1) model to fit adequately the predicted volatility of equity market returns and all macroeconomic series; hence, a similar method was adopted for this study.

The GARCH model was introduced by Bollerslev (1986) and is the most commonly employed class of time series models for studying volatility. According to Chinzara (2011), the GARCH(p,q) model is a parsimonious procedure and avoids over-fitting. Moreover, the GARCH(1,1) model is usually able to cover volatility clustering in the data and is a widely popular choice for researchers assessing the dynamic volatility of equity markets (Balli et al. 2015). The GARCH methodology has been briefly comprehensively described in several studies; hence, it is unnecessary to go into detail in this section. This process would generate a value series of return volatilities in the global market and twenty-three Islamic national equity markets.

The mean equation as the first equation of the AR-GARCH-M(p,q) model is expressed in Eq. (2).

$$Y_{i,t} = c + \beta_1 R_{i,t-1} + \beta_2 \sigma_{i,t} + \varepsilon_t. \tag{2}$$

The variance equation, as the second equation, is expressed in Eq. (3).

$$\sigma^2_{i,t} = \alpha_0 + \alpha_p \varepsilon^2_{i,t-p} + \lambda_q \sigma^2_{i,t-q}, \tag{3}$$

where $Y_{i,t}$ is equity market returns and macroeconomic series, respectively of economy i at time t; $\sigma_{i,t}$ is the square root of conditional variance of the series on economy i at time t; ε_t is error term at time t; $\sigma^2_{i,t}$ is the conditional variance of the error term at time t; ε^2_{t-p} is the squared error term at time $t - p$; σ^2_{t-q} is conditional variance at time $t - q$.

In the second step, the ADCC model is applied to obtain the measure of volatility spillover. This measure was generated from the econometric technique proposed

by Cappiello et al. (2006). They introduce the model to relate the asymmetric dynamic and time-varying patterns among financial markets. Utilizing this model, we created the volatility spillover measure by linking volatility in the global market to volatility in each Islamic market observed. This process produces a series of dynamic correlation coefficients for each equity market and obtains twenty-three data series. This measure becomes the dependent variable of panel estimation in the third step analysis.

Since the ADCC model has been used widely in many studies, for instance, Muharam et al. (2018) and Majdoub et al. (2016), this study only presents a short description. The basic advantage of this approach is applying the main features of standard GARCH models and explicitly creating a model of the time variations in covariance and correlation matrices. This approach is a simple generalization of the DCC-GARCH model created by Engle (2002), by involving the asset-specific correlation evolution coefficients and asymmetric dynamics in correlation.

In the last step, using the panel estimation technique, we examined the determinants' causality of volatility spillover for a series of whole monthly periods from May 2002 to February 2019, and cross-sectional samples of twenty-three Islamic equity markets. Panel data models have a better ability than purely cross-section or time-series data. Baltagi (2005) expounds on the panel data approach, which has advantages to control individual heterogeneity, such as firms and countries, to avoid biased results. For investigating the potential determinants of volatility spillover (*VSO*), we test the explanatory variables, including exchange rate volatility (*VFX*), inflation rate volatility (*VINF*), interest rate volatility (*VINT*), and industrial production growth volatility (*VIPG*). This step will prove the magnitudes of all four macroeconomic volatilities as the independent variables of volatility spillover.

The equation for the causality of explanatory variables on volatility spillover is expressed in Eq. (4). The coefficients of β_i (*beta* i) indicate whether the volatility of the remaining economic variables influences the volatility spillover from global to Islamic markets. In another section, we use the term of instability in national macroeconomic factors that means volatilities in macroeconomics factors.

$$VSO_{iG,t} = \alpha + \beta_1 VFX_{i,t} + \beta_2 VINF_{i,t} + \beta_3 VINT_{i,t} + \beta_4 VIPG_{i,t} + \mu_t, \tag{4}$$

where:
$VSO_{i,t}$ – volatility of asymmetric dynamics conditional correlation of returns between the Islamic equity market of country *i* and global market at period *t*;
$VFX_{i,t}$ – exchange rate volatility of country *i* with the USD at period *t*. It was conditional variance of exchange rate between country *i* – USD which resulted from $VFX_{i,t} = \omega_i + \alpha_i \varepsilon^2_{i,t-1} + \beta_i h_{i,t-1}$;
$VINF_{i,t}$ – inflation rate volatility of country *i* at period *t*;
$VINT_{i,t}$ – interest rate volatility of country *i* at period *t*;
$VIPG_{i,t}$ – industrial production growth volatility of country *i* at period *t*;
μ_t – *error term* at period *t*.

Results and discussion

Table 1 presents a descriptive summary of monthly Islamic market index returns for all twenty-three equity market samples between May 2002 and February 2019, totaling 201 observations for each market. It includes mean, standard deviation, maximum, and minimum values for nine emerging Islamic markets and fourteen developed Islamic markets. The nine emerging Islamic markets are the Czech Republic (CZ), Hungary (HN), India (IN), Indonesia (ID), Korea (KR), Malaysia (MY), Philippines (PH), Poland (PL), Turkey (TR). The fourteen developed Islamic markets are Austria (AT), Belgium (BL), Canada (CD), Denmark (DM), Finland (FN), France (FR), Germany (GM), Italy (IT), Japan (JP), the Netherlands (NT), Singapore (SG), Spain (SP), Sweden (SW), and the United Kingdom (UK).

For the emerging Islamic markets, the monthly average returns varied, with values ranging from –0.26 percent for Hungary to 0.86 percent for the Philippines. India and Indonesia have near similar average returns with the Philippines, i.e., 0.82 percent and 0.85 percent, respectively. However, the highest returns in the Philippines market was not accompanied by the highest risk, as measured by the standard deviation of returns (0.89) and the spread of returns (50.01 percent) ranging from a maximum value of 24.40 percent to a minimum of –25.61 percent. Similarly, the lowest returns in the Hungarian equity market were not accompanied by the lowest risk. The standard deviation (12.39) and the spread of returns (142.79) of this market had the highest values. Table 1 also shows Malaysia's Islamic market is a safe investment for international investors; the volatility is the lowest (5.13) in emerging Islamic markets. Two Islamic markets in Central Europe have lower market returns than emerging market returns in other regions. It appears that the Hungarian market has negative returns while the Polish market has lower returns of 0.35 percent. In addition, the highest risk for emerging markets is also found in a Central European market. The standard deviation of the Hungarian market is the highest in emerging markets.

For developed Islamic markets, Italy's equity market has the lowest average returns (0.09 percent), in contrast to the Danish market, which has the highest average returns (1.13 percent). Both markets have a similar standard deviation of returns of 6.38 and 6.17, respectively. In addition, the Finnish, French, Japanese, and UK markets have similar characteristics, in which the average monthly returns show 0.21, 0.23, 0.20, and 0.25 percent, respectively. The same characteristic in the average returns is also found for the markets in Austria, Belgium, Canada, Germany, Netherlands, and Sweden. Their average monthly returns range from 0.40 percent to 0.58 percent. The average returns for the two Central European markets (Austria and Germany) appear to be in the middle of the developed market returns of other regions.

The highest returns volatility in developed Islamic markets appear in Central European markets, i.e., Austria. Its standard deviation of returns is 8.97, which is close to the standard deviation of returns in the Finnish market (8.12). The other developed markets have similar characteristics, ranging from 4.95 (the UK) to 6.85 (Sweden). By contrast, the

lowest returns volatility in both emerging and developed markets is found in the Japanese market (4.43). It is a safer and more prudent investment than in the Malaysian Islamic equity market, which has the lowest returns volatility in emerging markets (5.13).

Table 1. Descriptive summary of monthly Islamic market indices returns

Emerging Islamic market returns					Developed Islamic market returns				
	Mean	St. Dev	Max.	Min.		Mean	St. Dev	Max.	Min.
CZ	0.62	8.35	19.8	–35.4	AT	0.51	8.97	24.8	–45.1
HN	–0.26	12.39	22.4	–120.4	BL	0.40	5.56	15.8	–22.1
IN	0.82	7.85	29.0	–36.1	CD	0.43	6.63	21.4	–35.0
ID	0.85	8.89	25.6	–51.6	DM	1.13	6.17	13.1	–27.2
KR	0.50	7.25	25.0	–24.3	FN	0.21	8.12	23.8	–29.4
MY	0.46	5.13	16.0	–23.7	FR	0.23	5.62	13.2	–22.1
PH	0.86	8.09	24.4	–25.6	GM	0.43	6.79	18.8	–30.6
PL	0.35	8.84	24.4	–38.6	IT	0.09	6.38	21.8	–21.4
TR	0.50	11.46	42.6	–46.7	JP	0.20	4.43	10.5	–17.4
					NT	0.41	6.67	18.1	–28.4
					SG	0.35	5.84	18.2	–36.6
					SP	0.72	6.48	21.2	–30.8
					SW	0.58	6.85	22.4	–31.1
					UK	0.25	4.95	12.4	–19.4

Source: data processed from www.msci.com (accessed: 4.10.2019).

Table 2 presents standard deviation values as one indicator for the instabilities of all macroeconomic variables, i.e., inflation and interest rates, industrial production growth, and change in the exchange rate, respectively. The inflation rate in most emerging economies, such as Poland, the Philippines, and South Korea, are stable at 0.33, 0.34, and 0.36, respectively. Interest rates are less stable in most emerging economies, particularly in Malaysia, South Korea, and India, ranging from 0.31 to 2.27. On the other hand, instability of the inflation rate for developed economies appears lower in Italy (0.20), Belgium (0.27), and the UK (0.29). It also shows that lower instability in the interest rate is found in Japan (0.22) and Singapore (0.90), while the other economies have similar conditions, ranging from 1.38 for the UK to 1.55 for Germany.

In addition, for emerging markets, the instability of the exchange rate is higher in Turkey and three Central European economies (Hungary, Poland, and the Czech Republic). Compared to emerging markets, the instability of the exchange rate in developed markets is more stable. Table 2 also shows that most developed markets have the same exchange rate movement and instability, namely Belgium (BL), Finland (FN), France (FR), Italy (IT), Netherlands (NT), Spain (SP), and the two Central European economies (Austria and Germany).

The main purpose of this study is to examine the influence of four macroeconomic volatilities on volatility spillover of the Islamic equity market. In a similar approach with Chinzara (2011), Zakaria and Shamsuddin (2012), and Alotaibi and Mishra (2015),

the volatility of each variable in this study is constructed using the GARCH(1,1) procedure. We perform volatility modeling steps by tracking the procedure to obtain the values of returns volatilities in each Islamic equity market and the global market. The procedure is also used to obtain volatility values of the four macroeconomic variables. In addition, the volatility spillover in this study means returns volatility in an Islamic equity market that is spilled over from returns volatility of the global market. We measure the volatility spillover by applying the ADCC technique, resulting in the dynamic correlation of volatilities between an Islamic equity market and global equity market, and making it a dependent variable in panel data estimation.

Table 2. Standard deviation of inflation rate, interest rate, industrial production growth, and change in exchange rate

Emerging markets					Developed markets				
	Inflation rate	Interest rate	Production growth	Exchange rate		Inflation rate	Interest rate	Production growth	Exchange rate
CZ	0.44	1.51	8.82	3.58	AT	0.35	1.50	9.14	2.88
HN	0.49	3.56	9.12	4.34	BL	0.27	1.52	7.82	2.88
IN	0.79	1.18	5.55	2.31	CD	0.36	1.28	3.89	2.76
ID	0.76	2.27	4.88	2.76	DM	0.38	1.58	9.24	2.92
KR	0.36	1.16	6.53	3.20	FN	0.31	1.49	8.61	2.88
MY	0.44	0.31	4.89	2.02	FR	0.32	1.40	14.62	2.88
PH	0.34	2.09	6.71	1.61	GM	0.36	1.55	9.40	2.88
PL	0.33	1.37	6.69	4.13	IT	0.20	1.44	28.68	2.88
TR	0.94	10.54	9.42	4.86	JP	0.30	0.22	7.94	2.63
					NT	0.48	1.50	7.21	2.88
					SG	0.52	0.90	10.90	1.60
					SP	0.60	1.50	15.20	2.88
					SW	0.41	1.54	13.23	3.39
					UK	0.29	1.38	6.10	2.59

Source: data processed from international financial statistics – International Monetary Fund.

Table 3 presents the coefficients of each of the four macroeconomic variables and the significance on volatility spillover (*VSO*) given by the pooled least squares model, the fixed effects model, and the random effects models. The four independent variables are exchange rate volatility (*VFX*), inflation rate volatility (*VINF*), interest rate volatility (*VINT*), and industrial production growth volatility (*VIPG*). Based on the three kinds of panel data estimation models, it could be decided which is the appropriate model to use to explain and discuss the coefficients of the variables. To make the results easier to interpret, Table 3 presents the estimation results analyzing not only all equity market samples but also each type of market, i.e., emerging and developed markets.

The Pooled LS model with 4623 observations for all twenty-three equity markets and 201 monthly periods was employed, and the results suggest that the volatility spillover of market returns is significantly affected by all volatilities of the exchange rate,

inflation rate, interest rate, and industrial production growth. Only interest rate volatility negatively affects volatility spillover, which is the opposite of the other three independent variables. Compared to fixed EM, the result is different in the significance of production growth volatility, which has no effect on volatility spillover, and in the value of adjusted R-squares (20 percent), which is greater than the value of adjusted R-squares obtained by the pooled LS model (0.5 percent). To select which of the pooled LS and fixed EM models was appropriate, we applied the Chow test, which showed that the fixed EM estimation is more appropriate.

Table 3. Results from panel data estimation models on volatility spillover

Variable		*C*	*VFX*	*VINF*	*VINT*	*VIPG*	Adj. R^2	*N*
All markets	*PLS*	***46.08	***1.04	***4.19	*–12.12	*1.357	0.005	4623
	FEM	***36.19	***1.58	***37.71	**–16.05	0.029	0.200	4623
	REM	***38.24	***1.59	***30.36	*–12.90	0.072	0.020	4623
Emerging markets	*PLS*	***23.12	*0.96	***11.22	–4.31	***12.57	0.031	1809
	FEM	***8.98	*0.96	***34.11	*–10.04	***26.66	0.109	1809
	REM	**10.51	*0.96	***31.29	*–9.51	***25.37	0.052	1809
Developed markets	*PLS*	***48.54	***13.26	***3.81	***–865.37	–0.26	0.056	2814
	FEM	***34.39	***15.62	***47.63	**–716.45	0.13	0.175	2814
	REM	***41.39	***15.69	***21.58	***–739.74	0.13	0.072	2814

This table presents the coefficients that result from the panel data regression using three models – pooled least squares (*PLS*), the fixed effects model (*FEM*), and the random effects model (*REM*) – on determinants of volatility spillover (*VSO*). The explanatory variables tested are exchange rate volatility (*VFX*), inflation rate volatility (VINF), interest rate volatility (*VINT*), and industrial production growth volatility (*VIPG*). The asterisks denote that the corresponding coefficient is significant respectively at the 1% level (***), the 5% level (**), and the 10% level (*).
Source: data processed from msci.com, bloomberg.com, and IFS-IMF.

Comparing all coefficients of each independent variable between the fixed and random EM estimation, particularly the values, significance, and signs, the results appear to be similar. To obtain the appropriate estimation from the panel data estimator techniques between both models, we selected the model by applying the Hausman test. The test showed that panel estimation of fixed EM is more appropriate, and the specification is better. As a result, the fixed EM estimation shows that exchange rate and inflation rate volatilities have a positive effect on volatility spillover, which is indicated by probability-values at the 1% level on positive coefficients of the exchange rate (1.577) and inflation rate (37.712); interest rate volatility has a negative effect on volatility spillover (**–16.046); production growth volatility has no effect on volatility spillover (0.029). It is expressed in the model specification as follows:

$$VSO_{iG,t} = ***36.192 + ***1.577\ VFX_{i,t} + ***37.712\ VINF_{i,t} - **16.046\ VINT_{i,t} + 0.029\ VIPG_{i,t}.$$

For nine emerging markets, we follow similar steps as applied in all twenty-three market samples and use the Chow and Hausman tests on three types of model estimation. We decide that the pooled LS and random EM models are inappropriate. The same decision was reached from the two tests for fourteen developed markets, which suggest that the model specification of fixed EM is better as the basis to interpret the estimation results. Subsequently, the model specification for emerging markets and developed markets are expressed respectively as follow:

$$VSO_{iG,t} = ***8.982 + *0.964\ VFX_{i,t} + ***34.109\ VINF_{i,t} - *10.036\ VINT_{i,t} + ***26.660\ VIPG_{i,t},$$

$$VSO_{iG,t} = ***34.386 + ***15.618\ VFX_{i,t} + ***47.627\ VINF_{i,t} - **716.436\ VINT_{i,t} + 0.131\ VIPG_{i,t}.$$

Employing 1089 observations, the estimation for emerging markets suggests that volatility spillover is affected significantly by all four macroeconomic variables. Specifically, it is positively affected by the exchange rate, inflation rate, and production growth volatilities, and negatively by interest rate volatility. Meanwhile, the estimation for developed markets, which employed 2814 observations, suggests that production growth volatility has no effect on volatility spillover. The coefficients of determination (adjusted *R*-squares) for the two types of samples are 0.109 and 0.175, respectively. It means that all macroeconomic variables in the estimation contribute to explaining the variation of volatility spillover amounts of 10.9 percent and 17.5 percent for emerging and developed markets, respectively.

The coefficients of exchange rate volatility (*VFX*) and inflation rate volatility (*VINF*) have positive values in three estimation results for all Islamic equity markets and each emerging and developed market sample. These indicate that when instabilities in an economy's exchange and inflation rates are greater, the volatility spillover of its Islamic equity market from the global market would be greater. Leung et al. (2017) state that exchange rate volatility influences the equity market because international investors need foreign currencies to purchase securities in international markets. Adjasi (2009) states that higher volatility in the inflation rate increases stock price volatility. The inflation rate should not be too high or low so that the goods prices is not be very expensive or cheap. This stability consequently leads to the returns volatility of a company's equity becoming lower and prevents volatility spillover from the other equity markets.

Conversely, the coefficients of interest rate volatility (*VINT*) in three estimation results have a negative direction. It suggests that when the interest rate's instability is greater, the volatility spillover of its Islamic equity market from the global market would be weaker. This finding corroborates Abbas et al. (2018), who examine equity market indices, the treasury bill rate, and the exchange rate. They concluded that there is a high collective impact from macroeconomic factors on equity market vola-

tility. This finding is similar to Adjasi (2009), who suggests that interest rate volatility could increase equity price volatility. Logically, this investment mechanism would occur in the link between interest rate volatility and the volatility spillover of the Islamic equity market.

The positive direction appears in the coefficients of production growth volatility (*VIPG*) for emerging markets, but its effect is insignificant for all emerging market and developed market samples. This evidence indicates that the greater the instability in an economy's production growth, the greater the volatility spillover of its Islamic emerging market. A similar finding was documented by Abbas et al. (2018), who concluded that industrial production growth volatility could influence the directions of equity markets, hence equity market volatility. The evidence for developed markets is in line with the result from Liljeblom and Stenius (1997), who found that industrial production has a weak link with equity market volatility. This is asserted by Morelli (2002), who stated that volatility in industrial production does not affect market volatility.

The findings of this study have important information for investors and national policymakers. Tracing the causality of macroeconomic stability on equity market volatility is important to ensure which factors determine the volatility in equity markets, making them easier to analyze and predict, and to the investment plans, make decisions, and exercise control. The sizable volatility spillover originating from the global market to a national equity market could be mitigated by controlling the macroeconomic factors. Policymakers should strengthen their equity markets by building a line of counterattacks from the global market and managing their decision on the stability of economic factors.

Our contribution solves the issues covering the instability of national macroeconomic factors proposed as determinant variables of spillover volatility from the global market index movement to the Islamic equity market. The results of this study could fill the gaps in the empirical research by supplying various figures of volatility spillover among the global market and Islamic equity markets. It provides conclusions about factors that influence volatility spillover and complements the body of knowledge in financial economics, especially Islamic financial assets, which are growing, and by using sophisticated research models.

Conclusion

Controversial findings on the presence of volatility spillover are present in existing studies, but the determinants have not been explored. Most prior studies on the volatility spillover issue emphasize how volatilities in an economy's macroeconomic factors influence market returns volatility. This study differs in the exogenous variable, which involves global market volatility and creates volatility spillover in an equity market that is focused on Islamic equity. In addition, it attempts to explain the poten-

tial effect of instabilities in four macroeconomic variables on the volatility spillover of Islamic equity markets.

Panel data estimation, in particular, the fixed effects model, was applied to test for causality for all twenty-three Islamic markets. The result empirically suggests that the instabilities of exchange and inflation rates positively affect volatility spillover. It means the higher the two instabilities of exchange and inflation, the higher the volatility in the Islamic market. Inversely, interest rate instability has a negative effect, while production growth instability has no effect on volatility spillover.

To obtain clear information because of the heterogeneous characteristics, we divided the market samples into developed and emerging markets. The results for all markets are not very different from the findings for developed market samples such as Austria and Germany in the Central European Region. Furthermore, inferential tests for Islamic emerging markets show that all four macroeconomic variables significantly affect volatility spillover. Specifically, increased instabilities of the exchange rate, inflation rate, and production growth, as well as decreased instability of the interest rate, could increase the volatility spillover from the global to Islamic emerging markets such as the Czech Republic, Hungary, and Poland in the Central European Region.

When the global market experiences higher volatility, the policies decided by the government or economic regulator should be able to prevent the unwanted effect, make the equity market stable, and attract market participants. The significance of controllable instruments by policymakers for the macroeconomic factors investigated in this study could be considered to solve the volatility problem in the equity market. National economic factors are sources of significant information for policymakers in making decisions and in the equity market. Policy management accompanied by prudent decisions in the macroeconomic and fiscal fields would stabilize the fluctuations of financial asset prices and equity market activities.

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Czy niestabilność krajowych czynników makroekonomicznych przyczynia się do przenoszenia zmienności stóp zwrotu z globalnego na islamski rynek akcji?

Niniejsze badanie dotyczy wpływu niestabilności makroekonomicznej na przenoszenie zmienności stóp zwrotu z globalnego na islamski rynek akcji. Badane czynniki ekonomiczne to kurs walutowy, stopa inflacji, stopa procentowa i wzrost produkcji. Aby osiągnąć cel badania, wykorzystano trzy narzędzia analityczne: model GARCH (p, q) do wyliczania wartości zmienności dla wszystkich zmiennych, model ADCC w celu uzyskania miary wpływu zmienności jako zmiennej zależnej oraz technikę regresji danych panelowych do oceny znaczenia przyczynowości czynników makroekonomicznych w przenoszeniu zmienności. Niniejsze badanie jest pierwszym, które rozszerza takie podejście. Obserwowano miesięczne dane dotyczące światowych i islamskich indeksów rynkowych, kursów walutowych, wskaźników cen konsumpcyjnych, stóp procentowych i wskaźników produkcji przemysłowej. Dane z okresu od maja 2002 do lutego 2019 roku pochodzą z rynku światowego i dwudziestu trzech

gospodarek – czternastu rozwiniętych i dziewięciu wschodzących rynków posiadających islamskie indeksy giełdowe. W kilku sekcjach przedstawiono ważne dodatkowe analizy dla pięciu rynków akcji w gospodarkach Europy Środkowej, które są porównywane z innymi rynkami. Wyniki badania sugerują, że na występowanie efektu przenoszenia zmienności wywodzącej się z rynku globalnego na rynki islamskie wpływa wewnętrzna niestabilność czynników makroekonomicznych, z wyjątkiem niestabilności produkcji przemysłowej na rynkach rozwiniętych, w tym na rynkach Europy Środkowej. Z badania wynika, że regulatorzy powinni przewidywać niekorzystne konsekwencje przenoszenia zmienności i zapobiegać im poprzez zorganizowanie wewnętrznej polityki gospodarczej w celu kontrolowania stóp inflacji, stóp procentowych i wzrostu produkcji przemysłowej, a także elastyczności kursu walutowego. Ponadto praktycy rynkowi powinni uwzględnić w swoich prognozach zmienność rynków globalnych i niestabilność makroekonomiczną, tak aby minimalizować ryzyko.

Słowa kluczowe: przenoszenie zmienności, kapitał islamski, model GARCH, model ADCC, dane panelowe

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The Development of Corporate Social Responsibility in the Context of Overcoming a Welfare State Crisis: a Theoretical and Empirical Analysis

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Abstract

The current social crisis, caused by the negative consequences of globalization, labor migration, and an aging population, requires the state's role in economic and social spheres to be reconsidered. In order to achieve and maintain sustainable economic growth, the pressing social problems, such as poverty, hunger, discrimination, and the unequal distribution of income, should be solved. Under these circumstances, the paper investigates the process of forming a welfare state to evaluate the role of current states in this period of social crisis. To achieve the aim, the following methods were used: historical and systematic analysis of the scientific literature and socio-economic conditions of the evolution of theoretical approaches of the welfare state, and the causes and characteristics of the present social crisis; cluster analysis of European countries to find similar patterns based on the level of corporate social responsibility (CSR) development, state social expenditures, and the government budget balance. The paper contains a detailed analysis and discussion of the formation of a welfare state. The study concludes that the process of delegating some state social services to the private sector in the form of CSR can be considered an efficient mechanism to eliminate and overcome the current social crisis through the accumulation of social capital. At the same time, the results of the cluster analysis of European countries

demonstrated the importance of CSR development as a compensator for the negative effects of a public welfare crisis and for solving pressing social problems in most European countries. Specific features of post-socialist countries in the context of social orientation of state policy and the development of CSR are highlighted.

Keywords: welfare state, social crisis, social policy, social protection, corporate social responsibility

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Introduction

According to the United Nations General Assembly Resolution "Transforming our World: the 2030 Agenda for Sustainable Development", humanity's overarching goals at the turn of the millennium are overcoming poverty, ensuring health care, access to education, decent working conditions, improving the well-being of the population, and reducing income inequality (United Nations 2015). The state should play a crucial role in redistributing income, providing social services, social protection and the insurance of citizens, financial support for the incapable population, and guaranteeing proper working conditions and the minimum level of remuneration. At the same time, the social-oriented transformation of developed countries shows that the escalation of globalization processes in the last third of the twentieth century contributed to the completion of a long cycle of affirming the welfare state in these countries. The dramatic change in the conditions of socio-economic development ushered in a new stage in the evolution of the welfare state, which is largely determined by the global transformation of world economic processes.

"Welfare state" concept development

The first attempt to determine the specific features of a welfare state was made in the nineteenth century by socialist scholars. The introduction of such a concept was linked to the need to overcome the negative effects of the Industrial Revolution, namely, rising unemployment, increasing poverty, and deepening social contradictions and imbalances. According to Geissler, the need for a socially-oriented state policy during this period was caused by the conflict between labor and capital. The aim of this policy was, therefore, to improve the working conditions of workers, ensure full employment and social security, promote the growth of capitalist production, mitigate socio-economic crises, prevent the elimination of jobs, and increase the status of employees (Geissler 1980).

At the same time, the dangers of impoverishing the population and the despair in the state encourage hired workers to commit crime, in the first place, against the

rich. This was extremely undesirable and dangerous to the authorities. Robert von Mohl drew attention to certain threats and "restrictions" of social support for the population, which may facilitate the transition from work or entrepreneurship to passive state aid (Chapman 2007). In contrast, Lorenz von Stein emphasized the importance of social support in empowering the working class to raise capital and become self-sufficient, which cannot be achieved without the state's help aimed at strengthening the middle class (Gordon 1991).

The Great Depression had a significant impact on the theory and practice of state social policy. During this period in Western Europe, about 30 million people were unemployed. The middle-class, in particular, suffered as their welfare level fell below the poverty line. At the same time, in the USA, industrial production declined by 50%, there were about 15 million unemployed, more than 5,000 banking institutions closed, and natural population growth declined significantly (Smiley, n.d.). To solve these problems, the governments of the world's leading countries substantially transformed their social policies. Thus, according to Roosevelt's «First New Deal,» working hours were increased in the USA, a minimum wage was set, overtime was paid, labor relations were established through trade union organizations, and the unemployed were involved in public works (e.g., the construction of roads and bridges, infrastructure facilities). Subsequently, Roosevelt's "Second New Deal" strengthened the state's social protection system by establishing a social insurance scheme and expanding the social rights and guarantees of employees (Smiley, n.d.).

The Great Depression and its aftermath prompted economists to reconsider the basics of classical economic theory. The founder of macroeconomic theory, Keynes, argued the concept of state influence in his classic work "The General Theory of Employment, Interest and Money" (Keynes 1936). Considering the pace of economic development at the time, he proved that a market economy is not a self-regulatory system, and economic equilibrium is not the result of the functioning of the free market. Therefore, the state should intervene in the market during times of crisis or recession by stimulating aggregate demand as a basis for the push for economic growth. According to Keynesian theory, aggregate demand can be increased by reducing the interest rate that will stimulate entrepreneurship; increasing state budget expenditures for the purchase of goods and services, public works; redistributing the national income in favor of the low-income population; and introducing a progressive tax system (Keynes 1936). All these state regulation measures were aimed at increasing employment and the income of the population to stimulate aggregate demand and economic growth. The implementation of these recommendations in the state regulation of the economy and the social relations of most developed countries contributed to the successful overcoming of the crisis, the recovery, and the development of national economies until the recession of the 1970s.

The theory and practice of forming and implementing a "social market economy" model, which is based on the principles of ordoliberalism in post-World War II Germany, is essential. The theory of the social market economy was established by Eucken and was based on ensuring openness of the market and free competition, freedom

of all business transactions, private property, and businesses taking full responsibility for the results of their activities (Kolev et al. 2014). At the same time, in "Social market economy" (1947), Müller-Armack determined that the distinctiveness of the social market economy is the combination of market freedoms with the principle of social equalization. In other words, the task of public policy is to ensure conditions of free competition and the equalization of income through rational fiscal policy. This policy provides financial support to the population who have suffered losses as a result of the war, payments and subsidies to socially disadvantaged groups, and the provision of social security and preferential loans, among others (Rooks 2019).

These principles were put into practice by German Chancellor Ludwig Erhard, and it led to the so-called "German Economic Miracle." Post-war Germany achieved economic growth thanks to the state's active socio-economic policy to ensure free competition and control the redistribution of national income to prevent significant social differentiation and promote full employment (Volker 2015).

After World War II , the welfare state concept was ensured at the legislative level in the Federal Republic of Germany, France, Japan, Italy, Spain, Portugal, and Sweden. The main goal of public policy in those countries was to regulate the social, political, and economic life of society to provide a sufficient level of social protection for all citizens, social justice, and solidarity of the state and the citizen (Zadoia and Palladin 2017). It was about implementing the principles of equal distribution of income and responsibility that cannot be achieved without government intervention. The welfare state's main tasks were guaranteeing a minimum household income, preventing social risks, creating satisfactory living conditions for citizens, promoting social equality and fairness (Aravacik 2018).

Consequently, in the post-war period, European countries raised public expenditures to boost the economy. Thus, in Germany, public expenditures reached 27% of GDP in 1950, 30% in 1955, and 50.3% in 1975. Similar changes occurred in other European countries. In particular, in France, the level of public expenditures was 24.1% of GDP in 1950 (Mauro et al. 2013). At the same time, the unemployment rate was decreasing. In Germany, it was 0.4% in 1962, and it remained at such a low level until the economic crisis of the 1970s (OECD Data, n.d.).

Competition with the socialist countries and the deployment of the social democratic movement in Europe had a significant influence on Western countries' social policy during this period. It started with the creation of the Social Democratic Party of Germany in 1875. Later, the Social Democratic Party was formed in Denmark in 1876, Austria-Hungary in 1889, and Italy in 1892. Initially, most of these parties' programs focused on reforming the existing social order towards forming a welfare state. After the Second World War, the Social Democratic parties significantly strengthened their influence and authority. In the second half of the twentieth century, they headed the governments of almost all Western European countries that launched large-scale nationalization programs (the Labour Government in Great Britain, the Social Democratic Government of Germany, and the Socialist Government of France).

The economic literature now distinguishes three welfare state models which were formed in different groups of countries under the influence of the specifics of their historical and institutional development:

1) the liberal model, based on private property and a market economy; the provision of certain social services are transferred to the private sector in the form of private insurance and private pension funds; financial social assistance is provided to the poorest citizens, and the level of well-being of the population depends solely on their own efforts and activities. This model aims to minimize economic inequality and is used in the United States, Canada, the United Kingdom, Ireland, and Australia;
2) the conservative model, based on a socially-oriented market economy, where the state is called upon to minimize the inequalities that have arisen as a result of the economy's market conditions by providing access to education, financial assistance in old age and sickness, and affordable housing, among others; the main task of the state is to ensure equal opportunities for all citizens whose personal well-being depends on their own aspirations and efforts; state policy aims at the redistribution of material goods, while the sum of social payments depends on the amount of income, insurance payments, etc. This model is followed by Austria, France, Germany, and Italy;
3) the social-democratic model, where social services are provided exclusively by the state sector, and sufficient budget revenues are ensured by high taxes and the profits of state-owned enterprises; the state seeks to reduce the income gap and ensure equal rights for all citizens, promote full employment, provide decent working conditions, protect the environment, and make medicine accessible. Countries that follow this model include Sweden, Switzerland, Norway, Finland, Denmark, and the Netherlands (Esping-Andersen 1990).

An important stage in the evolution of these welfare state models was the economic crisis of the 1970s, which affected all developed countries. According to some critics, the crisis was the result of Keynesian policies and excessive government intervention in the economy, which failed to counteract the negative impact of the following three factors: (1) the collapse of the Bretton Woods monetary system (1971); (2) the oil crisis (1973); (3) the stock market crises (1973–1974). As a result, the US and Western Europe saw a significant reduction in production, and rising unemployment and prices. In particular, in Germany, more than one million workers lost their jobs, the volume of gross national product decreased by 4%, and the volume of industrial production fell by 7.5%. In the United States, the unemployment rate increased by 4% from 1974–1975, reaching 9% (Zarnowitz and Moore 1977; Urquhart and Hewson 1983).

These crises and shocks helped to transform the socio-economic policies of the world's leading countries toward liberalizing the economy and reducing many social programs. In particular, the Thatcher Government's neo-conservative policy in the UK was aimed at overcoming inflation, curbing public intervention in the economy and social sphere, reducing social sector funding and narrowing down the bureaucrat-

ic apparatus, and transferring unprofitable state-owned enterprises to private ownership (Middleton 1996). Reagan led the reorientation of the US government policy towards tax cuts to promote modernization and private sector growth. Public demand and consumption increased, public expenditures were redistributed in favor of technological development, and social expenditures were reduced (Niskanen 1988).

Crisis of the welfare state

At the end of the twentieth century, scientists and politicians began to talk about the crisis of the welfare state. The collapse of the socialist system and the need to assist the countries of the former socialist camp who were looking to integrate into the world market economy were important factors in deepening the crisis. The global financial crisis of 2008 and the increasing volatility of global economic development should also be considered. Today, despite the financial and social differences between European countries, many of them have outstanding debt accompanied by a low economic growth rate. Seeking to maintain a high level of well-being and social protection, they are unable to reduce social security contributions, which could provoke a wave of protests and dissatisfaction with the state. Consequently, a reduction in government contribution to the accumulation of capital can be seen, first and foremost, by reducing investments in infrastructure and innovative projects, which slows down innovation progress as a whole.

Furthermore, the migration crisis, the ever-increasing financial liabilities associated with the aging of the European population, and the need to increase healthcare contributions should be added. The combination of the relatively free movement of skilled labor and high standards of state social security leads to increased unemployment and corresponding financial pressure on the public sector, exacerbating the current crisis and demographic problems that are addressed by attracting workers from overpopulated countries. The welfare state crisis is also manifested in the widespread disparity in income distribution, the narrowing of the middle class, and considerable separation of the population. Summarizing these trends, we can distinguish the following signs of the welfare state crisis:

1. Reducing public expenditures on social security in most European countries after the global financial and economic crisis, with relatively stable levels or a slight growth in countries such as Estonia, Germany, Latvia, Lithuania, Luxembourg, Poland, and Switzerland (Figure 1).

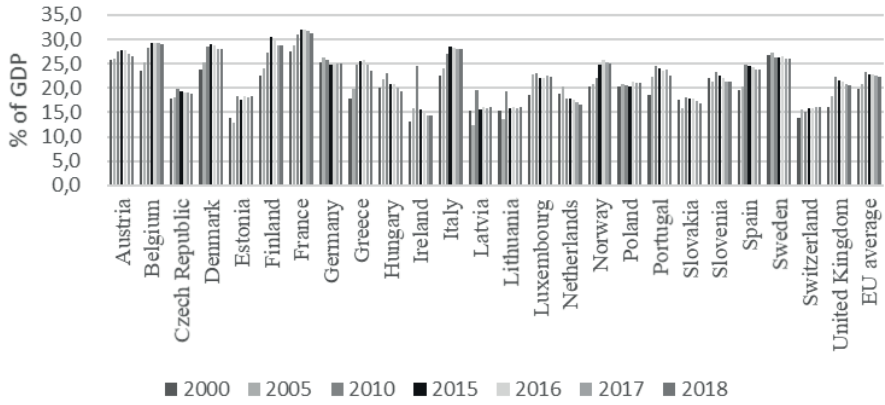


Figure 1. Government social expenditures (% of GDP)
Source: authors' own elaboration based on data from The World Bank (2020).

One of the factors behind these processes within the EU was the increase in assistance to financially fragile countries. According to 2018 data, 12 European countries have a national budget deficit, which varies between 2.5% of GDP (Spain and France) to 0.2% of GDP (Poland), and they require financial assistance from partner countries to balance their budgets. Countries with government surpluses (the Netherlands with a surplus of 1.5%, Germany with 1.9%, and Luxembourg with 2.7% of GDP) play the role of creditors in this situation, providing financial resources to stabilize their more vulnerable European partner countries (Figure 2).

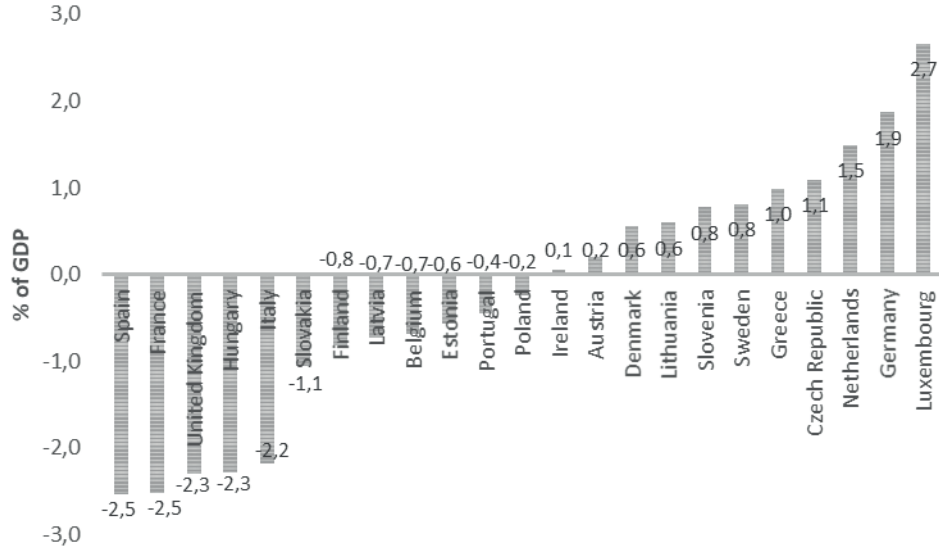


Figure 2. Government budget balance (% of GDP), 2018
Source: authors' own elaboration based on OECD (2020).

2. The lack of a visible correlation between the share of public expenditures (% of GDP) and the equality of income distribution among the population. An analysis of the relationship between the ratio of the total income of the richest 10% to the poorest 10% of the population to the level of public social expenditure as a share of GDP as of 2017 confirms that increased public social spending is not accompanied by a proportional improvement in the distribution of income among the population (Figure 3).

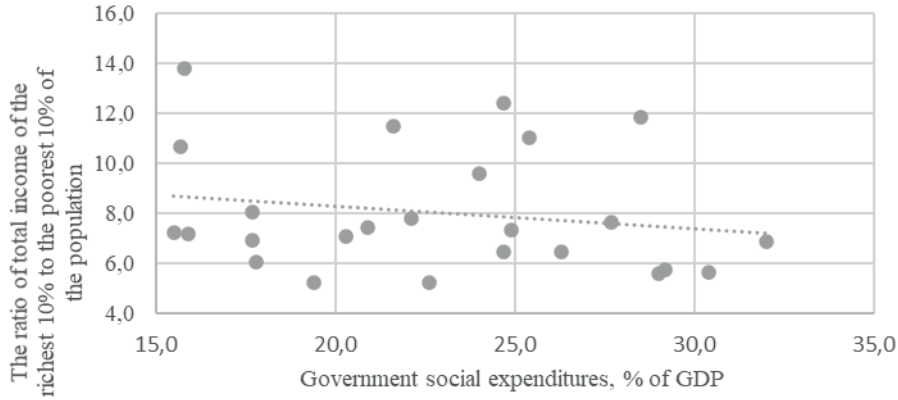


Figure 3. The relationship between income distribution and the level of government social expenditures, 2017
Source: authors' own elaboration based on Brien et al. (2019) and The World Bank (2020).

3. The inefficiency of state social expenditures. At present, there is a steady increase in the needs and expectations of society regarding the volume and list of public sector services and guarantees that are associated with an aging population. The data presented in Figure 4 on the volume (as a share of GDP) and types of public social expenditures (pensions and expenditures for the workable population), the volume of public financing of social services (as a share of GDP), and the share of health care expenditures as of 2017 confirm that in most European countries, a large part of the financial contribution to social needs goes to paying pensions and providing health services. The highest government expenditures for the working-age population (% of GDP) are observed in Belgium (7.5%), Finland (6.6%), and Norway (6%). At the same time, the share of expenditure on the medical care of older people prevails as a specified group of people in need of more medical services than citizens of working age.

Figure 4. The distribution of government financial support and social services (% of GDP), 2017/2018
Source: authors' own elaboration based on OECD (2020).

4. The European migration crisis, which began in 2015 when 1,322,825 asylum applications were received in EU countries, most of which were directed to Germany (36% of all applications), Hungary (13.4%), Sweden (12.3%), Austria (6.6%), Italy (6.3%) and France (5.8%). In 2016, however, the number of applications decreased to 1,259,955, with 59.1% of applicants seeking asylum in Germany, 9.8% in Ita-

ly, and 6.7% in France. In 2017, the number of applicants decreased almost twice to 705,705 (to Germany – 31.5%, Italy – 18.3%, and France – 14.1%) (Eurostat 2020). These preferences of countries are driven by the difference in the social and financial security of asylum seekers. In particular, in Germany, each applicant receives financial assistance of 354 EUR per month, in Italy – 75 EUR per month, Sweden – 225 EUR per month, France – 204 EUR per month, and in Spain – 50 EUR per month during the asylum application period (Hodali and Prange 2018). This results in increased financial pressure on the state budget and the social commitments of economically stable European countries, which decided at the legislative level to provide certain social guarantees and financial assistance to refugees and individuals who were forced to leave their country of origin.

These transformations contribute to modifying the place and role of the state in today's global economy. It is a transition from social protection, based on the state's redistributive functions, to an active social policy aimed at stimulating high-productivity employment and activating the economic self-sufficiency of different segments of the population, based on realizing the benefits formed by the market mechanism. According to some researchers, there is a tendency to form a service state, which, unlike the welfare state, does not ensure economic equality of the population but provides equal educational, medical, and other services, thus, investing in social and human capital. Accordingly, the level of individual well-being is determined solely by the persistence of citizens, and financial social assistance is provided only to the needy (Golovashchenko 2016).

Important functions of the service state are to ensure environmental safety, promote competition and personal development, develop social partnerships, and actively engage with civil society institutions, which affect the effectiveness of the performance of the whole society, not just certain individuals. The public sector is therefore being reformed in many socially-oriented countries to narrow down the list of social services the state provides and to reduce government expenditures accordingly, as they are inefficient and do not bring the expected returns. Additionally, they should promote the activity and responsibility of citizens for their own well-being by creating conditions for self-development (Khoma 2014).

In our opinion, an important way to overcome the welfare state crisis is the voluntary involvement of business in solving social problems in the form of corporate social responsibility (CSR). It is about a socially-oriented business activity that can directly influence the redistribution of income in society, solving pressing social problems, implementing educational and cultural projects, developing local infrastructure, providing social protection and insurance for employees, and financing their training.

Today, such activities help meet the needs and expectations of all stakeholders (Piasecki and Gudowski 2017). Moreover, it is about recognizing the important role of human, intellectual, and social capital as the newest factors in the global competitiveness of individual companies and the national economy as a whole. Thus, according to the data presented in Figure 5, there is a direct correlation between the level of gov-

ernment social expenditures (% of GDP) and the level of social capital accumulation. At the same time, as our previous research showed, the development of CSR is also an important factor in social capital accumulation, through the creation and promotion of trustful relationships among stakeholders (Bazylevych et al. 2019).

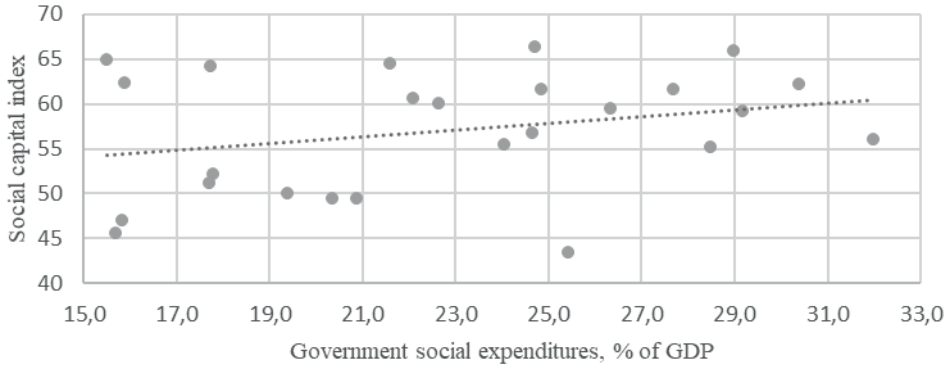


Figure 5. The relationship between government social expenditures (% of GDP) and social capital index, 2018
Source: authors' own elaboration based on Brien et al. (2019) and The World Bank (2020).

Corporate social responsibility implies business responsibility in four main areas: economic (the production of goods and services that are demanded by society), legal (the functioning of business in accordance with current legislation), ethical (the protection of the rights of employees, consumers and other stakeholders beyond the requirements stipulated by law) and voluntary (business response to the expectations and social needs of society, addressing such global social problems as poverty, hunger, and discrimination) (Carroll 1979).

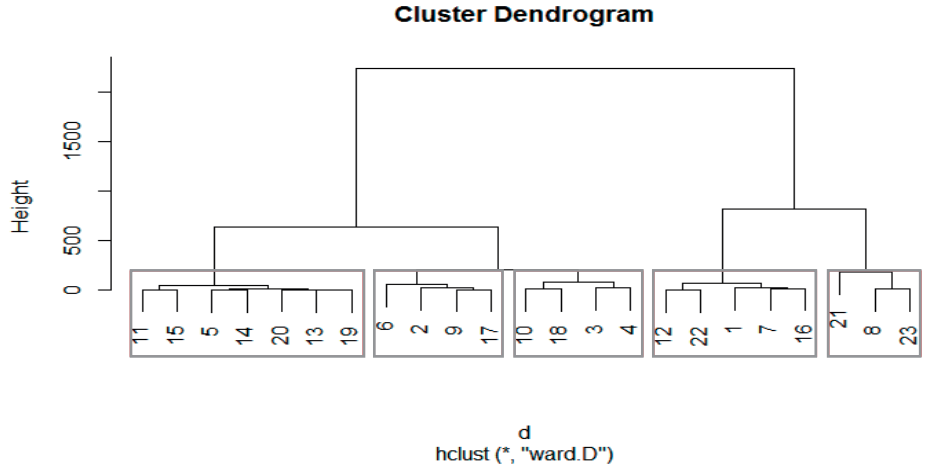
The implementation of the basic principles of CSR helps to solve many social problems through: 1) providing social support and protecting human rights (employees, consumers, suppliers); 2) charity or other forms of voluntary financial participation in solving pressing social national or local community problems; 3) encouraging employees to participate in charity projects and volunteering; 4) greening of the activity, which is seen in the transition to alternative energy sources and technologies with a minimum negative impact on the environment, the reuse of materials and the principles of zero waste production (Mikołajek-Gocejna 2018).

As mentioned above, CSR development contributes to the accumulation of social capital by building trusting relationships through following the principles of business ethics towards consumers, employees, partners, and the environment, providing honest information on product characteristics, reporting on social activity, and organizing or involving business in training and sports events for employees and their families and the local community, among others. At the same time, it is about raising tax revenues, as the social orientation of commercial activity leads to increased profitability, as well as the improved global competitiveness of the economy by forming loyal busi-

ness relations with consumers and suppliers, gaining competitive advantages in the international market, accumulating the new forms of capital, and launching innovative environmentally friendly technologies.

Analysis and results

Ensuring the social orientation of the economic development of states requires the active involvement of business in this process. It is about developing corporate social responsibility as an important factor in overcoming the general welfare crisis, which is linked to reducing social expenditures accompanied by government deficits. In order to identify groups of countries that implement such a policy, the authors clustered 23 European countries by state social expenditure (% of GDP), government budget balance (% of GDP), and the level of CSR development (number of companies adhering to the relevant principles) for 2018.



(1-Austria; 2-Belgium, 3-Czech Republic, 4-Denmark, 5-Estonia, 6-Finland, 7-France, 8-Germany, 9-Greece, 10-Hungary, 11-Ireland, 12-Italy, 13-Latvia, 14-Lithuania, 15-Luxembourg, 16-Netherlands, 17-Poland, 18-Portugal, 19-Slovakia, 20-Slovenia, 21-Spain, 22-Sweden, 23-United Kingdom)

Figure 6. Cluster analysis outcome
Source: conducted by the authors.

The results of the analysis (Figure 6 and Table 1) allowed us to distinguish five groups of countries:

1) the countries of the first group (Estonia, Ireland, Luxembourg, Latvia, Lithuania, Slovakia, and Slovenia) are characterized by a positive balance of the state budget (0.26% of GDP on average), social expenditures at 18% of GDP, and the lowest level of CSR development (about 17 companies reported on implemented CSR projects on average). The level of income distribution in these countries

averages 30.5% and varies from 24.1% (Slovakia) to 37.8% (Lithuania). The level of social capital development of these countries is within 45.5 (Latvia) and 64.9 (Ireland) with an average index value of 54.46;

2) countries of the second group (Finland, Belgium, Greece, and Poland) are characterized by high levels of government social contributions (25.55% of GDP on average), low levels of government deficit (0.18% of GDP), and medium levels of CSR (153 companies published non-financial reports, on average). In addition, this group of countries has a low level of income disparity (28.7% on average), and the level of social capital development in these countries is 53.52;
3) the third group of countries (Hungary, Portugal, the Czech Republic, and Denmark) have relatively low social security (22.19% of GDP), low government deficit (0.2% of GDP), and low CSR development (85 companies reported on CSR, on average). These countries are characterized by a low level of income differentiation (28.2% on average) and a medium level of social capital development (55.18);
4) the fourth group of countries (Italy, Sweden, Austria, France, the Netherlands) has the highest level of social protection (25.7% of GDP, on average), a national deficit of 0.44% of GDP (on average), and a relatively high level of CSR development (266 socially responsible companies on average). At the same time, the level of income distribution in these countries averages 29.4%, and the level of social capital development is 59.28;
5) the fifth group of countries (Spain, Germany, and the United Kingdom) is characterized by state social security expenditures at 23.15% of GDP, on average, a budget deficit at 0.97% of GDP (on average), and a high level of CSR development (about 500 companies on average). The income distribution in these countries is less equal (33.1% on average), but the level of social capital development is higher than in the other groups of countries (60.93 on average).

Thus, the cluster analysis confirmed the importance of CSR development as a compensator for the negative effects of the public welfare crisis and for solving pressing social problems in most European countries. As for the countries of the former socialist camp, they show certain peculiarities in the context of the problem under study. An analysis of the development practices of Slovakia, Slovenia, Poland, Hungary, and the Czech Republic showed the following characteristics:

1) significantly lower government expenditure on social protection (17% of GDP in Slovakia, 18.7% in the Czech Republic, and 19.4% in Hungary) compared to the average level in developed European countries (around 25% of GDP);
2) a low level of CSR development. The lowest level of CSR development is observed in Slovenia (17 companies) and Slovakia (13 companies). At the same time, the highest results are achieved by Hungary and Poland, which have 114 and 141 companies, respectively, that report on their social activities. These figures are low compared to Italy and Sweden (287 and 288 companies).

Table 1. Characteristics of clusters of European countries, 2018

Countries	Government social expenditures (% of GDP)	Government budget balance (% of GDP)	CSR development (number of firms)	Gini index	Social capital index
1st cluster					
Estonia Ireland Luxembourg Latvia Lithuania Slovakia Slovenia	17.96	0.26	16.71	0.305	54.46
2nd cluster					
Finland Belgium Greece Poland	25.55	–0.18	153.00	0.287	53.52
3rd cluster					
Hungary Portugal Czech Republic Denmark	22.19	–0.20	85.50	0.282	55.18
4th cluster					
Italy Sweden Austria France Netherlands	25.69	–0.44	266.60	0.294	59.28
5th cluster					
Spain Germany United Kingdom	23.15	–0.97	495.67	0.331	60.93

Source: designed by the authors.

Conclusion

The historical and systematic analysis showed that the first interpretation of the concept of a welfare state was formed by socialist scholars in the nineteenth century to minimize the negative effects of the industrial revolution. However, the concept transformed following historical circumstances and the needs of the state and population.

Later, the Great Depression had a significant impact on the theory and practice of state social policy. Following Roosevelt's "Second New Deal," the state social protection system was strengthened by establishing a social insurance scheme and expanding the social rights and guarantees of employees.

In post-World War II Germany, the concept of a "social market economy" was formed, and it was defined as the combination of market freedoms with the principle of social equalization through rational fiscal policy. The policy aimed to give financial support to the population who had suffered losses as a result of the war, payments and subsidies to socially disadvantaged groups, and provide social security and preferential loans.

Next, the economic crisis of the 1970s affected and transformed the socio-economic policies of the world's leading countries towards liberalizing the economy and reducing many social programs. At the end of the twentieth century, the crisis of the welfare state began. The collapse of the socialist system and the need to assist the countries of the former socialist camp who were looking to integrate into the world market economy were important factors in deepening the crisis.

In addition, the global financial crisis of 2008 and the increasing volatility of global economic development were causing economic instability and the lack of social protection of the population. Moreover, the migration crisis, the ever-increasing financial liabilities associated with the aging of the European population, and the need to increase healthcare contributions should be added. The combination of the relatively free movement of skilled labor and high standards of state social security led to increased unemployment and corresponding financial pressure on the public sector. It exacerbated the current crisis and demographic problems that are addressed by attracting workers from overpopulated countries. Also, the welfare state crisis can be seen in the widespread disparity in income distribution, the narrowing of the middle class, and the considerable separation of the population.

Thus, during the present welfare state crisis, the delegation of some state social functions to the private sector in the form of corporate social responsibility helps to overcome negative consequences. When the private sector undertakes certain state social functions, it reduces the financial pressure on the budget, contributes to solving urgent social and environmental problems, stimulates the accumulation of new forms of capital, enhances the country's global competitiveness in the long run, and promotes population well-being.

At the same time, the cluster analysis for European countries proved the crucial role of CSR development as a compensator for the negative effects of the public welfare crisis and for solving pressing social problems.

For the countries of the former socialist camp, CSR development is an important direction of social policy transformation to optimize public expenditure and compensate for social losses related to radical socio-economic challenges and shocks due to market transformations and integration into the global economic environment.

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Rozwój społecznej odpowiedzialności biznesu w kontekście przezwyciężenia kryzysu państwa opiekuńczego: próba analizy teoretycznej i empirycznej

Obecny kryzys społeczny spowodowany negatywnymi konsekwencjami globalizacji, migracji zarobkowej i starzenia się społeczeństwa, wymaga ponownego rozważenia roli państwa w sferze gospodarczej i społecznej. Ponadto, w celu osiągnięcia i utrzymania trwałości wzrostu gospodarczego, należy rozwiązać zasadnicze problemy społeczne, takie jak ubóstwo, głód, dyskryminacja i nierówny podział dochodów. W tych okolicznościach praca ma na celu zbadanie procesu kształtowania się koncepcji państwa opiekuńczego w celu oceny roli dzisiejszych państw w okresie kryzysu społecznego. Aby osiągnąć cel pracy, zastosowano następujące metody: historyczną i systematyczną analizę literatury naukowej oraz społeczno-ekonomicznych uwarunkowań ewolucji teoretycznych ujęć państwa opiekuńczego, przyczyn i cech obecnego kryzysu społecznego; analizę skupień krajów europejskich w celu znalezienia podobnych wzorców na podstawie poziomu rozwoju społecznej odpowiedzialności biznesu (CSR), wydatków socjalnych państwa oraz salda budżetu państwa. Artykuł zawiera szczegółową analizę i omówienie powstawania koncepcji państwa opiekuńczego. Z badania wynika, że proces delegowania części państwowych usług socjalnych do sektora prywatnego w formie CSR można uznać za skuteczny mechanizm eliminacji i przezwyciężenia obecnego kryzysu społecznego poprzez akumulację kapitału społecznego. Jednocześnie wyniki przeprowadzonej analizy skupień krajów europejskich dowiodły znaczenia rozwoju CSR jako kompensatora negatywnych skutków kryzysu opieki społecznej i rozwiązywania palących problemów społecznych w większości krajów europejskich. Ponadto zwrócono uwagę na specyfikę krajów postsocjalistycznych w kontekście społecznej orientacji polityki państwa i rozwoju CSR.

Słowa kluczowe: państwo opiekuńcze, kryzys społeczny, polityka społeczna, opieka społeczna, społeczna odpowiedzialność biznesu

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The Economic Efficiency of Traditional and Islamic Banking (a Comparative Analysis of the Turkish, Azerbaijani, and Iranian Banking Sectors)

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Abstract

The article attempts to develop a methodology for a comparative assessment of the economic efficiency of banks, including traditional and Islamic banking models. The assessment shows that the stability of financial institutions in Azerbaijan is lower compared to banks where Islamic banking is used. The assessment also shows that there is a strong dependence of the GDP growth rate on the sub-indices of the effectiveness of financial institutions in Azerbaijan, Turkey, and Iran. The methodology of linear regression and a composite index of the economic efficiency of banks are applied. The assessment shows that the influence of the stability of the financial system on economic growth in Azerbaijan, Iran, and Turkey is different. The economic growth rate and the ratio of bank loans to bank deposits in Azerbaijan and Turkey are positively related, but negatively in Iran.

Keywords: financial institutions, access to financial institutions, the depth of financial institutions, the effectiveness of financial institutions, the stability of financial institutions

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Introduction

In the cycle of economic relations, banks play the role of intermediary. However, this intermediary, operating in the money market, also affects the market for goods and services.

Banks accept the unspent part of economic entities' income as savings on certain conditions and transfer them to other entities that need funds on other conditions, such as a loan. Funds that are a deposit for one entity and remain unused can turn into a production factor for another entity, in the form of investment. In other cases, such loans increase aggregate demand, as they stimulate consumption and, indirectly, affect aggregate supply.

To fulfil their functions, commercial banks can receive loans from the Central Bank at a lower interest rate and provide them to economic agents at higher interest rates. In this case, loans provided by the bank either become production factors as investments or they increase the level of consumption and the aggregate demand of economic agents. The reverse process may also occur. That is, a reduction in the volume of bank loans can reduce the volume of financial resources – investments aimed at the production process, as well as reduce the volume of consumption. Thus, the aggregate demand curve will go to the left. Banks play an exceptional role in the existence of the economy, performing such functions as saving, lending, including current billing, among others.

Under the condition of *ceteris paribus*, different economic results of banking systems that differ in essence are also observed in traditional and Islamic banking models.

Literature review

As early as 1912, Schumpeter noted that the development of financial institutions was important in stimulating economic growth (Schumpeter 1912). The Cobb-Douglas function, which is an important model of economic growth, also attracts the attention of TFP (technological factor of production) along with capital and labor. The development of education and health, as well as the development of financial institutions, is an integral part of this factor. In the economic literature, there are more frequent studies on the impact of financial institutions on economic growth.

Based on a study of the literature, we can unequivocally conclude that there is a causal relationship between financial development and economic growth, and financial development is recognized as necessary for economic development. However, no uniform relationships were identified. There are at least five hypotheses that have been found both at the national and regional levels, at different periods. The first hypothesis, in which financial development leads to economic growth, is the earliest and most popular.

Studies conducted by King and Levine (1993), De Gregorio and Guidotti (1995), and Khan and Senhadji (2000) also used transverse OLS or two-stage least squares regression. Despite differences in individual countries and variables, they found a significant positive relationship and confirmed that financial depth is a prerequisite for economic growth. Levine et al. (2000) studied the impact of legal reforms in finance and found that legal reforms are the determining factors in financial development and economic growth.

A study by Samargandi et al. (2015) argues that in the short run, there is a negative relationship between finance and economic growth. Even an inverted U-shaped connection is possible. This study used the ARDL model and concluded that financial development affects growth in different countries in different ways. In several studies, a relationship has been established between the development of the stock market, the financial and banking systems, and the growth of real GDP per capita (Estrada et al. 2010).

This suggests that institutional reforms in each country have different effects on economic growth, and that these reforms contribute to growth. This study used regression with a fixed and random effect. Similarly, Bayar (2014) used the same methods and discovered the positive impact of financial development on economic growth.

The second hypothesis is that economic growth stimulates financial development. Liang and Teng (2006) and Ang and McKibbin (2007) used the VAR infrastructure, co-integration, and causality tests to prove a close and unidirectional correlation, i.e., the reason for financial development was economic growth. Ang and McKibbin (2007) took into account the effects of financial repression. Financial repression, represented by the required reserves ratio, liquidity ratio, loans, and deposit rates, was negatively associated with financial depth and growth. But De Gregorio and Guidotti (1995) observed a negative correlation between financial liberalization and economic growth in Latin America.

The third hypothesis is that economic growth and financial development stimulate each other. Many studies prove this. For example, Hassan et al. (2011) used OLS and WLS regression for the panel model and VAR for the time series. Borlea et al. (2016) did not mention the influence of financial institutions but used only financial market indicators such as market capitalization, stock trading volume, and turnover to represent financial development. These studies show a twofold orientation of cause and effect relationships between economic growth and financial development.

In the studies of Hye (2011), the ARDL model was used and, as an indicator of financial development, a PCA was built based on indicators of creditworthiness, money supply, and the stock market. Short-term and long-term negative links between financial development and growth were found. A study conducted by Al-Malkawi et al. (2012) found negative links between finance and growth. And this study showed an inverse but negative relationship between finance and growth in the United Arab Emirates.

In the study of Gulaliyev et al. (2019), a banking stability indicator (BSI) was calculated by using the Minimax normalization method. The composite index was used to analyse the financial stability of the banking sector in 29 countries and to build a risk map based on their national basic economic indicators. The proposed BSI index is intended both for comparative international assessment of the financial stability of the banking sector and for its evaluation in the country. It gives the ability in the most general form to assess the banking sector from the point of view of international competitiveness and to compare it with other countries.

Our paper comparatively investigates three different financial institutions' impacts on economic growth in different countries. Their distinguishing feature is related to the number of Islamic banks in their financial system. Iran's financial system fully includes Islamic banks, while Azerbaijan's financial system does not have any. Meanwhile, Turkey has a mixed bank system, i.e., it has an Islamic and traditional banking system. Thus, we try to compare these three financial systems' impacts on economic growth by comparing impacts of 1) access to banking sectors; 2) the depth of the financial institutions; 3) the effectiveness of the financial institutions, and 4) the stability of the financial institutions of these neighbour countries. As well as we used a composite index for an investigation that is different from composite indices, suggested by Svirydzenka, K. (2016) and Cámara, N. (2017) and etc.

Essential hypothesis: There are no differences between Islamic and traditional banking systems from an efficiency perspective.

Methodology

The access to financial institutions index covers 36 subindexes (GFDR 2018). Based on these indicators, a composite indicator, such as the Financial Institutions Access Index (FIAI), can be calculated to assess the level of development of a country's finan-

cial system. This indicator can be obtained by indexing and summing the same weight of each of the above sub-indices, i.e.

$$FIAI_{i,t} = \frac{1}{n}\sum_{j}^{n}\left(\frac{FIA_{i,j,t} - FIA_{t,min}}{FIA_{t,max} - FIA_{t,min}}\right) \quad (1)$$

where, $FIAI_{i,t}$ – Index of Access to Financial Institutions of country *i* in year *t*; $FIA_{i,t,j}$ – indexed value of subindex *i* by subindex *j* in year *t*; $FIA_{t,min}$ – the minimum possible value of sub-index *j* for the financial system of countries in year *t*; $FIA_{t,max}$ – the maximum possible value of sub-index *j* for the financial system of countries in year *t*. For all subindexes, measured in percent, we can assume $FIA_{t,min} = 0$ and $FIA_{t,max} = 100$.

For the 6th, 7th, and 8th subindex, $FIA_{t,min} = 0$, a $FIA_{t,max}$ can be taken, respectively, 100,000, 1000, and 100,000. We can compare the effectiveness of the banking systems of several countries, according to FIAI, using subindexes in which the principles of Islamic and traditional banking models may differ.

The Depth Index of Financial Institutions consists of 14 subindexes. Using these subindexes, the Financial Institutions Depth Index (FIDI) can be calculated. Such a composite index can be expressed by the formula:

$$FIDI_{i,t} = \frac{1}{n}\sum_{j}^{n}\left(\frac{FID_{i,j,t} - FID_{t,min}}{FID_{t,max} - FID_{t,min}}\right) \quad (2)$$

where, $FIDI_{i,t}$ – Index of Access to Financial Institutions of country *i* in year *t*; $FID_{i,t,j}$ – is the indexed value of subindex *i* by subindex *j* in year *t*; $FID_{t,min}$ – the minimum possible value of subindex *j* for financial systems in year *t*; $FID_{t,max}$ – the maximum possible value of subindex *j* for financial systems in year *t*.

For all subindexes, measured as a percentage, we can assume $FID_{t,min} = 0$ and $FID_{t,max} = 100$. We can compare the efficiency of several countries' banking systems by FIDI using subindexes in which the principles of Islamic and traditional banking models may differ.

The effectiveness of the financial institutions index contains ten subindices. Based on these indicators, we can calculate the composite Financial Institutions Effectiveness Index (FIEI) as follows:

$$FIEI_{i,t} = \frac{1}{n}\sum_{j}^{n}\left(\frac{FIE_{i,j,t} - FIE_{t,min}}{FIE_{t,max} - FIE_{t,min}}\right) \quad (3)$$

where, $FIEI_{i,t}$ – Index of Access to Financial Institutions of country *i* in year *t*; $FIE_{i,t,j}$ – is the indexed value of subindex *i* by subindex *j* in year *t*; $FIE_{t,min}$ – the minimum possible value of sub-index *j* for the financial systems of countries in year *t*; $FIE_{t,max}$ – is the maximum possible value of subindex *j* for the financial systems of countries in year *t*. For all subindexes, which are measured in percent, we can consider

$$FIE_{t,min} = 0 \text{ and } FIE_{t,max} = 100.$$

The stability of financial institutions can be calculated using seven subindexes. For a comparative analysis of the stability of financial institutions based on these indicators, a composite index – the Financial Institutions Stability Index (FISI) – can be calculated as follows:

$$FISI_{i,t} = \frac{1}{n}\sum_{j}^{n}\left(\frac{FIS_{i,j,t} - FIS_{t,min}}{FIS_{t,max} - FIS_{t,min}}\right) \tag{4}$$

where, $FISI_{i,t}$ – Stability Index of Financial Institutions of country *i* in year *t*; $FIS_{i,t,j}$ – indexed value of subindex *i* by subindex *j*; $FIS_{t,min}$ – the minimum possible value of subindex *j* for the financial systems of countries in year *t*; $FIS_{t,max}$ – the maximum possible value of sub-index *j* for the financial systems of countries in year *t*. For all subindexes, which are measured in percent, we can consider $FIS_{t,min} = 0$ and $FIS_{t,max} = 100$. We can compare the effectiveness of several countries' banking systems by FISI using subindexes in which the principles of Islamic and traditional banking models may differ.

The Financial Development Composite Index (FDCI) can be calculated based on the four indices listed above as:

$$FDCI_{it} = FIAI_{it} + FIDI_{it} + FIEI_{it} + FISI_{it} \tag{5}$$

The OLS method is the most widely used method used to study the impact of development, including the access to depth, effectiveness, and stability of financial institutions on economic growth. Based on this method, the regression relationship between subindexes characterizing the rate of economic growth and the indicators of access, depth, effectiveness, and stability of financial institutions on economic growth can be expressed as:

$$Y_t = \alpha_0 + \sum_{i}^{n} X_{it} + \varepsilon_t \tag{6}$$

In this study, we will express as Y_t both the rates of economic growth and the volume of GDP per capita at year *t*, and as X_{it} – indicator *i* at year *t*.

Data

In the course of the study, we will consider some of the indicators used in the World Bank's Global Financial Development Report (GFDR 2018) as the main indicators characterizing the banking sector. This report contains indicators that characterize

not only the activities of banks but also the activities of the financial system as a whole. However, since we are interested in a comparative analysis of the economic efficiency of traditional and Islamic banking models, we will use only indicators that relate to banks from the report. The World Bank, in its report "Global Financial Development," quantitatively measures the level of development of the financial sector, including the banking system, by country. The most recent report was conducted at the end of 2017 and covers 214 countries. The level of financial development is estimated based on 117 sub-indicators. The main indicators characterizing the development of the banking system are: 1) access to financial institutions; 2) the depth of financial institutions; 3) the effectiveness of financial institutions; 4) stability of financial institutions.

Results

A comparison of the banking systems of Azerbaijan, Turkey, and Iran on the Financial Institutions Access Index (FIAI)

Based on the methodology, we will consider $FIA_{t,min} = 0$, and $FIA_{t,max} = 1000$ for the 6th and 7th sub-indices. Thus, calculations show that for the financial systems of Azerbaijan, Iran, and Turkey for the period covering 2004–2016, the Financial Institutions Access Index (FIAI) had dramatically different dynamics. In Iran, which practices Islamic banking in general, the FIAI has an ever-growing dynamic. Only in 2016 did it fall slightly. Indicators for FIAI Azerbaijan are mainly lower than in Iran and Turkey. Only in 2009 and 2013 did Azerbaijan overtake Iran in this indicator. An interesting fact is that this indicator has a "wavy" character in both Azerbaijan and Turkey (Figure 1).

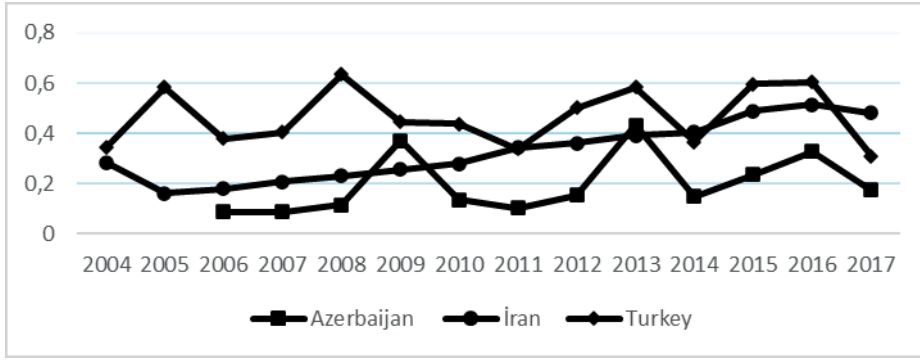

Figure 1. Dynamics of the Financial Institutions Access Index (FIAI)
Source: authors' own elaboration based on GFDR (2018).

A comparison of the banking systems of Azerbaijan, Turkey, and Iran on the Financial Institutions Depth Index (FIDI)

Azerbaijan's Depth of Financial Institutions Indicators for the period 1993–2016 show that only the dynamics in the "the ratio of liquid obligations to GDP" subindex is positive. Other indicators do not show steady growth. "The ratio of central bank assets to GDP" initially decreased (1993–1997), and then increased (2001–2010). During the period of rapid GDP growth in the country (2001–2010), this indicator sharply decreased and then increased again (2001–2015). After the devaluation of 2015, a slight decrease is observed. This upward and downward trend is not characteristic of Iran's financial institutions. The "ratio of central bank assets to GDP" in this country, where Islamic banking is used, generally decreased, from 14.5% (1993) to 2.4% (2016), although there were exceptions.

In Turkey, sharp "fluctuations" are not characteristic of this subindex. But despite this, against the background of changes accompanied by a slight fluctuation in the form of growth and decrease, the "ratio of central bank assets to GDP", with some exceptions, increased from 3.7% (1993) to 9.4% (2002), and in subsequent years it steadily decreased to 0.58% (2016). Thus, both in Turkey and Iran, there is a tendency for this indicator to decrease in the long term.

One of the most important differences between Islamic banking and traditional banking is the form of providing loans to the private sector. In many countries, banks believe that when lending to the private sector, participation in incomes instead of a specific interest rate creates additional risk for banks and, therefore, prevents the use of Islamic banking. However, Iran's high rating in terms of "the ratio of local credit for the private sector to GDP" indicates the possibility of achieving mutual trust and profitability in Islamic banking. Comparing the dynamics of this subindex for the period 1993–2016 shows that compared with Iran and Turkey, in Azerbaijan, the share of local loans directed to the private sector in GDP is much less. However, what is encouraging is that in Azerbaijan, the share of loans provided by banks to the private sector in the volume of GDP is steadily growing. The devaluation of the manat in 2015 significantly reduced this figure.

We can compare the depths of banking systems in Azerbaijan, Iran, and Turkey, according to the FIDI, using sub-indices that may differ in traditional and Islamic banking principles. Based on FIDI calculations for all three countries, we can note that the depth of financial institutions in Iran where Islamic banking is used is higher compared to Turkey, which uses Islamic banking, and Azerbaijan, which does not use it (Figure 2). In recent years, the tendency toward improving sub-indices that characterize the depth of financial institutions has intensified in Azerbaijan. The activities of insurance companies in the country improved, and the share of the assets of these companies in GDP increased from 0.54% to 1.17% for the period 2007–2014. It should be noted that this indicator was not high in Iran at that time (0.94%), while in Turkey it increased from 2.51% to 3.87%.

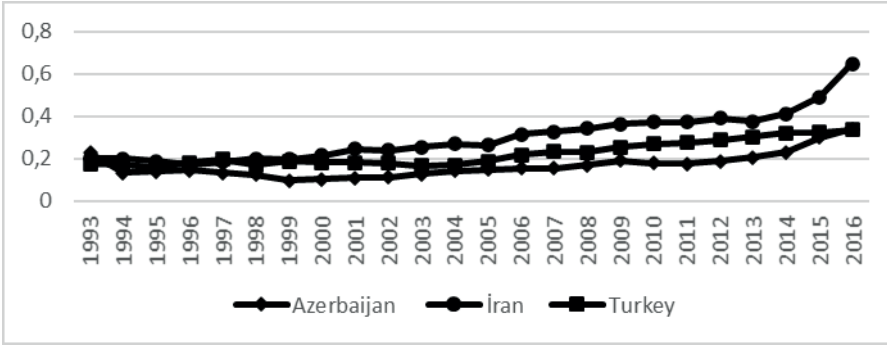

Figure 2. Financial Institutions Depth Index dynamics
Source: authors' own elaboration based on GFDR (2018).

A comparison of the banking systems of Azerbaijan, Turkey, and Iran on the Financial Institutions Effectiveness Index (FIEI)

The dynamics of the ten main sub-indices that characterize the effectiveness of financial institutions in Azerbaijan for the period 1993–2016 show that the ratio of bank expenses to incomes in Azerbaijan developed in waves. However, despite short-term growth and decline, there is a tendency for this relationship to grow in the long run. This result can be associated with both a reduction in income and an increase in expenses. However, in the long run, this is mostly associated with high costs. In the short term, the indicator of the difference between bank interest rates on loans and deposit rates increased and decreased in the studied years. However, in the long term, this indicator has a growth dynamic. The net interest margin of banks in these years underwent short-term fluctuations of 3–5% during the period 1996–2001, but rapidly increased until 2005, reaching 10%. However, in subsequent years, it fell sharply and in 2011 amounted to 4.75%. Between 2012 and 2016, there were again fluctuations in the range of 4–7%. The level of non-interest income is high in Azerbaijan's banks. In 2003, the ratio of non-interest income to total income exceeded 70%, although this figure has been steadily declining, and in recent years has fluctuated around 20%. For comparison, in Turkey, the ratio of non-interest income of banks to total income decreased from 36% (1996) to 25% (2014). In Iran, this figure fluctuated between 20–30% over the years.

If short-term fluctuations and differences in this indicator are not taken into account, then the indicators of all three countries are gradually approaching each other (Figure 3).

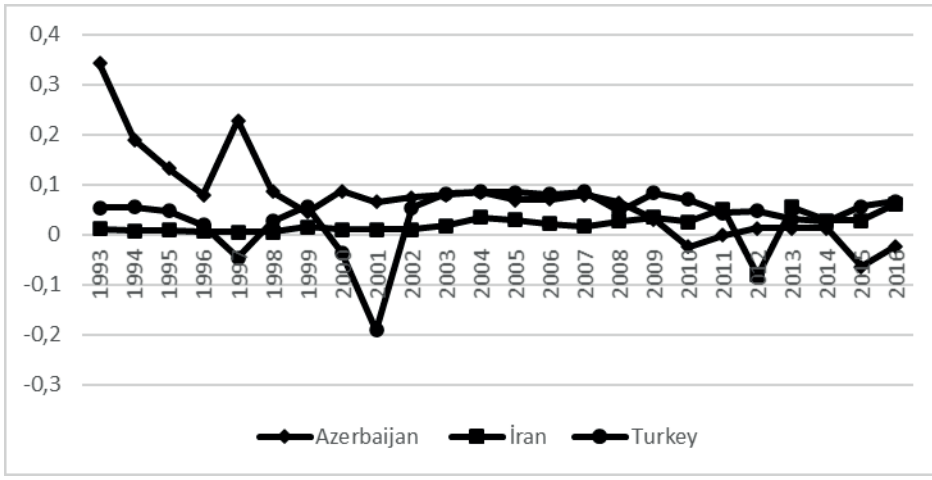

Figure 3. Financial Institutions Stability Index dynamics
Source: authors' own elaboration based on GFDR (2018).

A comparison of the banking systems of Azerbaijan, Turkey, and Iran on the Financial Institutions Stability Index (FISI)

A comparative analysis of the FISI for the three countries shows (Figure 4) that the stability of financial institutions in Iran, where Islamic banking is used, is higher. Turkey's performance exceeds Azerbaijan's after 2009, although this indicator is lower in both countries compared to Iran.

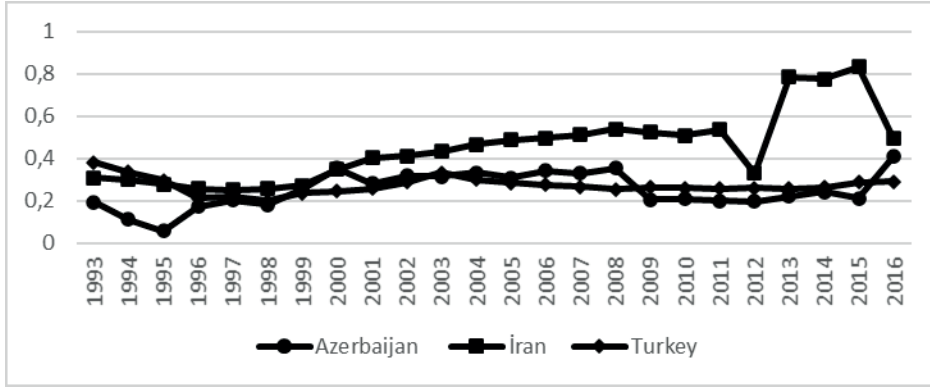

Figure 4. Financial Institutions Stability Index (FISI) dynamics
Source: authors' own elaboration based on GFDR (2018).

The effectiveness of financial institutions

The relationship between the composite Financial Institutions Effectiveness Index (FIEI) and GDP growth rate, as well as the volume of GDP p.c., is polynomial in calculating these relationships. When calculating the FIEI, two of the ten subindexes, i.e., the ratio of bank expenses to income and the ratio of bank expenses to total assets, are included in the composite index with a negative sign and subtracted from the general indicators. The indexed value of the remaining indicators is included in the composite index with a positive sign.

Our calculations show that there is no linear regression between the Financial Institutions Effectiveness Index (FIEI) and GDP growth rates. When calculating the relationship between GDP volumes, two of the ten sub-indices, i.e., the ratio of bank expenses to income and the ratio of bank operating expenses to total assets, are not included in aggregated indices, including a negative index. The relationship between the FIEI composite index and the economic growth rate, as well as the volume of GDP p. c. calculated on the basis of these indicators, is weak.

A regression analysis of the dependence of the rate of economic growth on sub-indices of the Efficiency of Financial Institutions over the past 16 years shows that in Azerbaijan, the rate of economic growth mainly depends on three sub-indices – 1) the bank's net interest margin; 2) the ratio of non-interest income of the bank to total income; 3) the ratio of loans granted to state-owned enterprises to the volume of GDP. Dependence on the other seven sub-indices is negligible.

The calculations demonstrate there is a negative connection between Azerbaijan's rate of economic growth and the net interest margin of the bank, the ratio of non-interest income of the bank to total income, and the ratio of loans granted to state-owned enterprises to the volume of *GDP* (Table 1).

Table 1. Dependence of the GDP growth rate on the sub-indices of the Financial Institutions Effectiveness Index in Azerbaijan

	Coefficient	Standard error	t-statistics	P-value
Y intersection	5716.38	1456.6	3.92	0.011
Net interest margin of the bank (%)	–400.95	109.7	–3.66	0.015
The ratio of non-interest income of the bank to total income (%)	–37.18	12.0	–3.11	0.027
The ratio of loans granted to state enterprises to the volume of GDP (%)	–123.59	34.6	–3.57	0.016
F significance = 0.001	Multiple R=0.99	Standard error =165.16	observations =16	

Source: authors' calculation based on GFDR (2018) and World Bank (2018).

Iran's economic growth rate strongly depends on only one of the indicators described above, which characterizes the efficiency of the financial system – the ratio

of loans granted to state-owned enterprises to the volume of GDP and this dependence is positive, unlike in Azerbaijan (Table 2).

Table 2. Dependence of the GDP growth rate on the sub-indices of the Financial Institutions Effectiveness Index in Iran

	Coefficient	Standard error	t-statistic	P-value
Y intersection	199.57	52.71	3.79	0.001
The ratio of loans granted to state enterprises to the volume of GDP (%)	66.54251	11.57018	5.75	0.000
F significance =0.000	Multiple R=0.77	Standard error =176.5	observations =24	

Source: authors' calculation based on GFDR (2018) and World Bank (2018).

The dependence of the GDP growth rate in Turkey on the sub-indices as the ratio of bank expenses to income, net interest margin of the bank, the ratio of non-interest income of the bank to total income, the profitability of bank capital show that Turkey's economic growth rate strongly and negatively depends on only four of the ten sub-indices that characterize the effectiveness of financial institutions (Table 3). The dependence on the remaining six indicators is weak.

Table 3. The dependence of the GDP growth rate on the sub-indices of the Financial Institutions Effectiveness Index in Turkey

	Coefficient	Standard error	t-statistic	P-value
Y intersection	1268.92	128.68	9.86	0.000
The ratio of bank expenses to income (%)	–8.70	1.91	–4.57	0.000
Net interest margin of the bank (%)	–25.34	8.90	–2.85	0.014
The ratio of non-interest income of the bank to total income (%)	–8.21	2.34	–3.51	0.004
return on bank capital (%, before tax)	–9.63	3.69	–2.61	0.022
F significance = 0.000	Multiple R=0.96	Standard error =51.11	observations =21	

Source: authors' calculation based on GFDR (2018) and World Bank (2018).

When calculating the FISI using seven stability sub-indices of financial institutions, we will enter only one indicator (the ratio of bank loans to bank deposits) in the composite index with a negative sign. High values of this indicator adversely affect stability. If one introduces other indicators in the FISI with a positive sign and calculate and comparatively analyse the impact of this indicator on the GDP growth rate, including the volume of GDP p.c. for Azerbaijan, Turkey, and Iran, it will become obvious that the correlation between these three indicators is weak for all three countries.

Analysing the dependence of the economic growth rate on the stability indicator of financial institutions using the example of financial institutions of Azerbaijan

based on data for a 21-year period, we can determine that only two of the indicators, i.e., "the ratio of bank loans to bank deposits" and "the ratio of liquid assets to deposits and short-term financing," have a strong correlation with the rate of economic growth (Table 4).

Table 4. Dependence of GDP growth rate (1993 = 100) on sub-indices of Financial Institutions in Azerbaijan

	Coefficient	Standard error	t-statistic	P-value
Y intersection	–14.93	269.68	–0.06	0.956
The ratio of bank loans to bank deposits (%)	11.16	1.26	8.84	0.000
Ratio of liquid assets to deposits and short-term financing (%)	–10.59	4.51	–2.34	0.031
F significance =8.78E–10	Multiple R =0.95	Standard error =223.19	Observations =21	

Source: authors' calculation based on GFDR (2018) and World Bank (2018).

Analyzing the dependence of the economic growth rate on the FISI using the example of Iranian financial institutions based on data from a 24-year period, it can be determined that only one of the indicators, "the ratio of bank loans to bank deposits," has a strong correlation with the rate of economic growth (Table 5).

Table 5. Dependence of the GDP growth rate (1993 = 100) on the stability sub-indices of Financial Institutions in Iran

	Coefficient	Standard error	t-statistic	P-value
Y intersection	–417.13	156.13	–2.67171	0.014
The ratio of bank loans to bank deposits (%)	–417.13	1.86	5.523661	0.000
F significance =0.000	Multiple R =0.76	Standard error =180.79	Observations =24	

Source: authors' calculation based on GFDR (2018) and World Bank (2018).

Analysing the dependence of the economic growth rate on the stability indicator of financial institutions using the example of financial institutions in Turkey based on data for an 18-year period, we can determine that five of the possible seven indicators, i.e., "the ratio of bank capital to total assets," "the ratio of bank loans to bank deposits," "the ratio of non-performing loans to total loans," "Z-account of the bank," and "The ratio of liquid assets to deposits and short-term financing" have a strong correlation with the rate of economic growth (Table 6).

The results of the regression analysis given in Tables 4–6 show that the influence of the financial system's stability on economic growth in Azerbaijan, Iran, and Turkey is different. The economic growth rates and the ratio of bank loans to bank deposits in Azerbaijan and Turkey are connected positively, but negatively in Iran.

Table 6. The dependence of the GDP growth rate (1993 = 100) on the stability sub-indices of Financial Institutions in Turkey

	Coefficient	Standard error	t-statistic	P-value
Y intersection	421.5389	110.8336	3.803349	0.003
The ratio of bank capital to total assets (%)	16.63862	7.230392	2.301206	0.044
The ratio of bank loans to bank deposits (%)	1.694942	0.360881	4.696675	0.001
The ratio of non-performing loans to gross loans (%)	–8.48512	2.698632	–3.14423	0.010
Bank Z-account	–20.0498	6.153906	–3.25806	0.009
Ratio of liquid assets to deposits and short-term financing (%)	–3.42435	0.864444	–3.96133	0.003
F significance =0.000	Multiple R R =0.99	Standard error =22.85	Observations =21	

Source: authors' calculation based on GFDR (2018) and World Bank (2018).

Discussion

The indicators of the economic growth rate were calculated in comparison with 1993. Connections can be expressed as a polynomial function. In this case, the maximum economic growth corresponds to a certain limit of the FIDI. In other words, the connection between economic growth and the FIDI can be positive, to a certain limit, and after that, it can be negative. These results in Azerbaijan, Iran, and Turkey cases on a comparative analysis of traditional and Islamic banking are close to the results of studies conducted by Liang and Teng (2006), Estrada et al. (2010), Samargandi et al. (2015), and Borlea et al. (2016).

Conclusion

Evaluating countries' ratings according to the above-mentioned indices shows that the FISI of countries with a GDP p.c. of more than $20,000 is in the range [0.1–0.3]. Countries with GDP p.c. in the right or left of this interval have much less than $20,000. In Iran, where the absolute Islamic banking model is used, this indicator has 0.065 points and is far beyond this interval.

The fact that the FISI of high-income countries is in the range [0.1–0.3] allows us to say that the stability of the banking system in this interval is necessary for economic development. However, we note that this is not a sufficient condition. Most of the countries in this interval are countries with a GDP p.c. less than $10,000. The FISI rating of countries with a GDP p.c. over $20,000 shows that even in this group, there is a "narrower" interval for high-income countries. The relationship between the FISI

and GDP p.c. means that for every country, there is an optimal stability interval. But when the country's FISI is in the range [0.1–0.3], the necessary conditions are created for its economic development.

The results show that the stability of financial institutions in Iran, where Islamic banking is used, is higher, according to FISI. Turkey's performance exceeds that of Azerbaijan after 2009. However, this indicator is lower in both countries compared to Iran. The study also shows that there is a strong dependence of the GDP growth rate on the sub-indices of the effectiveness of Financial Institutions in Azerbaijan, Turkey, and Iran.

The results of the regression analysis show that the influence of the stability of the financial system on economic growth in Azerbaijan, Iran, and Turkey is different. The economic growth rates and the ratio of bank loans to bank deposits in Azerbaijan and Turkey are positively related, but negatively in Iran.

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Efektywność ekonomiczna bankowości tradycyjnej i islamskiej (analiza porównawcza sektora bankowego w Turcji, Azerbejdżanie i Iranie)

W artykule podjęto próbę opracowania metodologii oceny porównawczej efektywności ekonomicznej banków, w tym modelu bankowości tradycyjnej i islamskiej. Wyniki oceny wskazują, że stabilność instytucji finansowych w Azerbejdżanie jest niższa w porównaniu z bankami, w których stosuje się bankowość islamską. Jak wynika z oceny, istnieje silna zależność stopy wzrostu PKB od wskaźników częściowych dotyczących skuteczności instytucji finansowych w Azerbejdżanie, Turcji i Iranie. Zastosowano metodologię regresji liniowej i złożony wskaźnik efektywności ekonomicznej banków. Wyniki oceny pokazują, że wpływ stabilności systemu finansowego na wzrost gospodarczy w Azerbejdżanie, Iranie i Turcji jest różny. Ponieważ tempo wzrostu gospodarczego i stosunek kredytów bankowych do depozytów bankowych są dodatnio powiązane w Azerbejdżanie i Turcji, ale negatywnie w Iranie.

Słowa kluczowe: instytucje finansowe, dostęp do instytucji finansowych, głębokość instytucji finansowych, efektywność instytucji finansowych, stabilność instytucji finansowych